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EVALUATION REPORT

ON-FARM DEMONSTRATION PROGRAMS

Agriculture Development Fund
Saskatchewan Agriculture

October 1987

prepared by

Brystra Consultants

Regina

87-124

management consulting and applied research

Brystra
Consultants

October 29, 1987

Dr. John Taylor
Manager, Agriculture Development Fund
Economics Branch
Saskatchewan Agriculture
3085 Albert Street
REGINA, Saskatchewan
S4S 0B1

Dear Dr. Taylor:

Please find enclosed our Evaluation Report on the On-Farm Demonstration Program.

It has been a special pleasure working with you on this challenging assignment. The cooperation of Departmental staff and other stakeholders has been excellent and much appreciated.

Should we be able to provide any further assistance, please do not hesitate to call.

Yours sincerely

BRYSTRA CONSULTANTS

Thomas A. Bryant

Thomas A. Bryant
President

TB:lh

Enclosure

2550-15th Avenue, Regina, Saskatchewan, Canada S4P 1A5
Telephone: (306) 352-1561 Telex: 071-2603

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Brystra
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EVALUATION OF ON-FARM DEMONSTRATION PROGRAMS

for the
Agriculture Development Fund
Saskatchewan Department of Agriculture
1987

EXECUTIVE SUMMARY

PURPOSE OF THE EVALUATION

The Agriculture Development Fund (ADF) represents a major investment ($200 million over five years) in the development of the province's leading economic sector. A major thrust of the Fund is to develop new technologies and to accelerate their adoption. Part of that effort is linked to the critical steps between R&D and wide-spread usage. Prior to ADF, that link had been supported by a program of small-scale on-farm demonstrations (OFDs). This evaluation focusses on the effectiveness of the previous OFD program (OFDP) - and on the lessons to be learned for ADF's revamped activities in technology diffusion.

DESIGN OF THE EVALUATION

The evaluation developed in two stages. In the first, key evaluation issues were identified on the basis of staff interviews, a literature review, and program analysis. Alternative evaluation methodologies were developed to suit various combinations of issues. Following a review by senior program staff, an evaluation design was finalized. In the second stage, the research was conducted, data analyzed, and this report prepared. The evaluation used several additional methods, including a survey of approximately 200 farmers who hosted demonstrations, numerous staff interviews, interviews with university and industry personnel, and a series of case studies based on OFDs.

MAJOR ISSUES AND FINDINGS

1. "What are the perceived strengths and weaknesses of the program, as seen by farmers, SDA staff, and researchers?"

Farmers hosting the demonstrations were generally enthusiastic. A few saw their demonstrations differently than did the associated Specialists. Several hosts were not very involved in the projects and not typical of real innovators or early adopters. The limitation of compensation to direct incremental expenses, excluding the farmer's own labour and equipment, was well-accepted in most cases.

Staff of SDA gave the program strong support in principle. The AgReps carried the bulk of the delivery burden, and had very limited time available to accomplish the work associated with the demonstrations. Technical support was sometimes inadequate to ensure accurate results.

University personnel were very modestly involved in this program, although other programs supported university-based demonstrations. Researchers' concerns lay outside the type of applied work conducted under

the OFDP. Researchers expressed concern about the technical quality of the OFDs. Examples of the university picking up an idea from a farmer-driven OFD were very rare. The level of contact between host farmers and researchers was so low as to raise fundamental questions about the effectiveness of technical and human factors feed-back from the farm level.

Private companies expressed interest in the marketing value of the OFDs as validation of their products, but involvement has been low. Some companies disagreed with the way their materials were used in OFDs. Companies were willing to support OFDs if projects are 'sold' to them. Distributors and sales agencies do not invest in 'research.' Much corporate product research is done outside Saskatchewan.

2. "In what areas does the technology transfer system used in On-Farm Demonstration require modification for effective delivery?"

Many pieces of successful tech transfer models and product introduction strategies were missing or used infrequently: prior consultation with targetted users; delivery of results to researchers and adopters; targetted communications focussing on the groups most likely to next adopt the innovation; design of demonstrations to test and prove specific issues to critical audiences; management responsibility for program results from idea generation to successful introduction rates. A market-oriented model, treating innovations as new products to be tested and introduced if successful, is a useful tool.

The number of demonstrations needed will vary on the basis of objectives and specific conditions, such as moisture/soil characteristics and communications capabilities within diverse commodity groups. Specific plans need to be developed for each demonstration and its intended audience.

The relative merits of concentrated and dispersed demonstration sites depend on the breadth of applicability of and interest in the innovation. Concentrated sites have the most impact if they allow farmers to make useful comparisons of applicable alternatives. Dispersed sites are harder to operate, monitor, and support, but are more effective ways to reach local audiences, especially those not at the leading edge of innovation.

Access to demonstration sites and information needs to be strengthened and well-publicized. Technologies may have to be moved, changed or repeated to successive waves of adopters to ensure that the next adopting group can access the right information at the time of key decisions.

AgReps provide a unique information brokerage, but are swamped with many different demands on their time. Large projects require more time than an AgRep can provide. Private sector agents would be better able to concentrate on specific transfer tasks, perhaps at the cost of the AgReps' general purpose role and perceived impartiality. Regional and Provincial Specialists, contracted managers, and employees of user associations may be able to provide effective alternatives.

Both general and specialized communication channels were evident. Standard ones (the Agricultural press, AgRep newsletters, etc.) tend to provide background information, primarily to identify and qualify the source for more detailed and personal consultation. In order to be effective, they need to be well-linked to the detailed sources which support actual decisions. More targetted channels are often associated with species associations, commodity groups, or community organizations. Special publicity efforts, such as a TV special, are called for in rare circumstances. Word-of-mouth within a peer group is the most effective means of communication, but must be supported by secondary sources. The OFDP did not tap these channels very effectively. Communications relied almost entirely on general channels rather than the higher impact targetted channels. Current plans and activities are headed in the right direction, but will need additional support to reach their potential.

3. "In what ways may cooperation with private industry be improved?"

Improved industry cooperation will be obtained through: contracted management of large demonstrations; more effective communication of results; technical assistance to ensure that processes are applied correctly, the results are scientifically meaningful, and new information is fed back to the sponsors in useful terms; contracted management of the project selection process, especially once the generic priorities have been set; credible product testing and advertising. Distinctions should be made between user-driven groups, such as species associations, and development or sales organizations; their interests and methods are quite different.

4. "Review On-Farm Demonstration objectives and make suggestions, if necessary, for changes to the Agriculture Development Fund."

Efficiency can be greatly improved through the development of clear program models and continuous evaluation of performance. A certain amount of technical failure, weather-related aberrations, and 'human error' should be expected. Economic results may be less than expected when actually applied by working farmers in their own fields. Other technologies may overtake a development. Credibility may be damaged before market introduction is complete. Most innovations will not achieve their full potential, but the OFDP system had no consistent or effective means of defining objectives or determining the causes and implications results. Effectiveness and the lack thereof was essentially uncontrolled. That must be changed if the investment in new technology is to be optimized.

There is an important gap between controlled experiments conducted by university personnel and field applications conducted by operating farmers; technologies developed in laboratory settings risk being orphanned as soon as they leave that setting. Field tests without laboratory controls or technicians provide important information on the 'robustness' of the innovation.

Another important gap exists between the support of 'innovators'/'early adopters' and the rest of the market. Accelerating the impacts of new technologies requires attention to the middle and late parts of the market cycle as well as the front end.

5. "Review On-Farm Demonstration administrative procedures and make suggestions, if any, for changes to the Agriculture Development Fund."

ADF operations and objectives appear to be moving in many of the right directions. Separation of large and small projects would be helpful. For larger demonstrations, contracted management will increase the expertise available and minimize the Fund's overhead load. Numerous projects will still likely require direct management by SDA staff.

Additional resources are needed to enhance the technical accuracy of OFDs. Better demonstration data will require more effort, probably paid. Use of summer students as technical assistants may help with the data collection and plot control.

The OFDP had limited success with critical communications goals - limited objectives hindered effectiveness. Many projects operated as low-quality technical tests or research projects rather than marketing demonstrations. Budgets for communications were vague and underfunded by far. Good plans were rarely built into the design and never supported throughout an OFD. Rarely was a target audience identified.

Promotion of results was poor and usually had little impact. Some hosts were not informed of the results or given copies of the reports. As should be expected, some of the demonstrations ended with results which were ambiguous or inconclusive, results not worth promoting but certainly worth review by program officials and researchers. Standardized communication channels are not adequate to deliver the desired imoact. The best diffusion occurs when targets are involved before the demo, i.e., in its selection and design. AgBoards do not always serve this purpose successfully. Some sterling examples of successful OFDs showed the necessity of special efforts, budgets, skills, etc.

Uptake was frequently very poor, at least as far as the evaluation team could determine. Some of the slowness can be attributed to concurrent economic cycles which tend to dampen risk-taking innovation. Often, uptake was simply unknown. Uptake can be measured if baseline data are collected for pre-defined target groups. Then clear purposes and demonstration hypotheses need to be built into the demonstration design. An emphasis on evaluable indicators of probable outcomes was non-existent, but possible in many cases. Monitoring the progress of the transfer effort through a sample of potential adopters over time is often possible.

Feasible improvements to demonstration projects centred on: clear designs in terms of the purpose of each demonstration, its expected results, follow-up plan and budget. An ability to recognize failure - and to direct that knowledge to the people who could reassess the technology and its prospects, possibly reworking it for improved performance, would also enhance the program. Some diversity in format is required and should be explicitly recognized.

Management resources would be better spent on the more complex projects and on ones requiring central organizational support. Small projects of local interest are most effective with local personnel making most of the decisions.

Selection of demonstration hosts is a complex matter. For some technologies, particularly those still at the field trial stage, hosts with a history of innovation and attention to detail are important. For technologies already moving into market adoption, community leaders or 'product mavens' are more important due to their ability to influence the adoption decisions of others.

MAJOR RECOMMENDATIONS

The recommendations which follow apply to the main program which we suggest should be devoted to the more complex end of the demonstrations which have been occurring to date. Recommendations related specifically to small projects of local interest are separated into the section dealing with the "Small Projects Fund" which we see as a subprogram within the ADF.

The Roles of Government

1. Government should continue to be involved in demonstration efforts to accelerate the identification, introduction, and application of beneficial new technology.

2. Public sector involvement should normally decline as the commercial potential of a technology becomes more clear.

3. In some instances, the government's desire to accelerate the implementation of new techniques will require stronger involvement later in the adoption cycle in an effort to supplement market forces.

4. Government involvement in demonstration also plays a useful role as a source of unbiased information for potential adopters. In order to serve this purpose, government support should be directed toward demonstrating generic products, or toward all-brands testing.

Purposes of On-Farm Demonstrations

5. Demonstrations should be much better planned and executed than they have been. In particular, new technologies, audiences and markets should be clearly defined, barriers to adoption identified, and demonstrations specifically designed to overcome the next critical barrier in the adoption process.

6. Pre- and post-project evaluations of each demonstration should address the equally important aspects of technological performance, economic value, and market response.

7. Evaluation research, showing the adoption patterns of other farmers, should be pursued and publicized in order to accelerate adoption in later stages of the innovation cycle, i.e., by the 'late majority.'

8. A special class of demonstrations should be undertaken with ordinary producers as a form of field trial to test the 'human factors' associated with adoption and usage of new techniques.

Communication Channels

9. Communication efforts associated with each demonstration project should be targetted to reach the specific audiences for whom the information is most relevant.

10. Farm-oriented third-party media have greater credibility than direct government publications and should normally be preferred to reach general farm audiences. Alternatively, new techniques must be found to improve the image and usefulness of government publications.

11. More detailed information related to actual implementation should be directed through commodity-specific channels or direct response materials.

12. General access to the information available from the research, development and demonstration efforts must be improved if producers are to find the correct information for their applications. Wider media coverage of program activities, including direct mailings should be pursued. Sources of information need to be more visible at the local level, although efficient storage and handling requires centralized management.

A Small-Projects Fund

13. A small-projects subprogram should continue within the ADF as a means of soliciting local farmer-initiated projects. The subprogram should be administered at the District level to the extent possible.

14. The focus on locally initiated projects should be maintained by limiting the subprogram to $2,500.00 per Ag. District per year, with no single project exceeding a contribution of $500.00 per year.

15. Funds should be allocated by the AgReps in accordance with program guidelines. Every effort should be made to reduce the overhead costs associated with these local demonstrations.

16. Project proposals, approved by the AgRep and reviewed by a Specialist, should be appended to the standard ADF contract for ease of administration. First choice should be given to proposals which fall within District priorities, although some discretion should be allowed to keep the program flexible enough to adapt to new opportunities and special situations.

17. Annual reviews of project results and proposals for District priorities should be a pre-condition for release by the ADF of the next year's funds to the District. Annual project reports showing objectives, activities, results, status, and implications should be required for each project in the form of a one-page abstract suitable for inclusion in the ADF database.

18. ADF should monitor these small projects to determine which situations indicate the need for either larger-scale demonstrations or improved management.

19. For farmer-initiated demonstrations in the 'small projects' category, no payment should be made for the host's labour. Commendation, community prestige, and early access to new technical information are more effective rewards. Every effort should be made to ensure a high profile for the demonstrations and commendation of the hosts.

Levels of Funding

20. A better balance between research, development, and demonstration budgets should be sought by dramatically increasing the demonstration share. An initial target of 20% of ADF expenditures for demonstration and information dissemination should be established as a means of ensuring that the money spent on research and development has the economic impacts that justify its support.

Roles of Participants

21. Initiation of projects should be open. Users' associations, individual producers, corporations, Specialists, ADF staff, and others can all be productive proponents. Non-government groups should be involved as active hosts, co-sponsors, or proponents wherever possible.

22. Regional and Provincial Specialists should be the mainstay of the SDA effort in larger demonstrations, from project design, through site management, to evaluation and dissemination of results. They will nonetheless need several forms of support, from technical assistance to communications, in order to fulfill that role.

23. AgReps should be given authority to operate small demonstration projects within their Districts. (See "Small-Projects Fund" above.) Their participation in larger demonstrations should ordinarily be expected to end with reporting local activity and making suggestions for larger projects.

24. The AgReps should continue as key brokers of entry-level information on new technologies, including the results of regional and provincial OFDs. They must have the resources to act as the first point of contact, without any expectation that they could personally provide the entire agricultural community with all of its technical information. Referral to printed material and Specialists should be their primary functions as brokers. Additional databases and training time should be provided as required to support them in this important role.

25. Involvement of potential adopters in demonstration design should be maximized to ensure that critical adoption issues are addressed. Potential adopters should be active stakeholders in demonstrations.

26. Greater involvement of third parties should be sought. In particular, user associations should be supported in their efforts to upgrade their members' decision-making ability. Contracts with such associations to develop and manage demonstration projects should be sought as a means to enhance the applicability of results.

27. Since it is unlikely that private companies whose primary business is the sale of proprietary technology will be seen as unbiased hosts of government demonstration projects, the private sector's incentive structure should be stimulated through features such as graduated taxes for the introduction of new technologies. Write-offs for contributions to third-party OFDs should be enhanced to maximize private sector support for demonstrations.

Administration

28. The ADF operates with far leaner staff/projects and staff/program expenditures ratios than similar programs in other jurisdictions. Increased activities and a desire for more effective results suggest that increases in both program management and support staff may be required. Particular attention should be paid to the following areas: technical assistance for demonstration hosts; clerical support services; identification of demonstration-ready technologies; management of the small-projects fund; liaison with industry and user groups; and communications. Compared with the OFD program, the ADF has moved to cover several of these areas, but does not yet appear to be up to a fully functional level for the scope of its program objectives and resources.

29. The systems available for identification of new, demonstratable technologies should be re-assessed. Both propagation within Saskatchewan and importation should be reviewed.

30. Greater co-ordination between the various phases of product development should be pursued. Greater staff resources might support such integration. Assignment of review and approval functions for the whole ADF to a single broad-based committee should be pursued, at least at the policy and major projects levels.

31. Most demonstration funds should be allocated on the basis of centralized decisions by experts in agricultural development. OFD funds should be concentrated on projects which can reach a significant portion of the intended audience in a short period of time. Adequate budgets for project management, evaluation of results, and communications should be included in the projects. The result is likely to be a shift toward much larger projects than occurred under the OFD program.

Links between OFDs and Research

32. Research, development, demonstration, and diffusion should all be considered as closely-related parts of the effort to accelerate the rate of adoption of new technology in Saskatchewan. Priorities should be assessed in terms of the development of ideas through these steps and the efforts required to overcome barriers to diffusion.

33. Research and development reports should indicate the readiness of new technologies for economic and market evaluations. Similarly, those evaluations should become an important input to research management so that R&D can be directed to areas needing technical solutions.

34. Demonstration reports should be copied to researchers in related fields. Managers of larger demonstration projects should actively involve researchers in their projects so that field applications and technical expertise are pulled more closely together.

Links to Marketing

35. Third-party comparison testing in highly visible areas should be pursued as a very effective means of allowing potential adopters to make their own decisions. It is important to provide sufficient information that farmers can estimate the performance of an innovation when adapted to their own operations.

36. Means should be explored to allow commercial organizations to refer to OFD results without putting the government in the position of endorsing propriety brands.

Further Research Needs

37. Further research should be conducted to identify the characteristics and identities of successful technology diffusers in Saskatchewan. That information should then be used to help guide the recruitment and selection of OFD hosts.

38. A critical gap in the diffusion process may remain between making RD&D information available and convincing producers that a new technique can be adopted successfully on their farms. Further research should be conducted on farm-level decisions about the adoption of new technologies. That research should address all stages of the market cycle, from early to late adopters.

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I. INTRODUCTION TO THE EVALUATION

This report presents the findings of an evaluation of the FarmLab On-Farm Demonstration (ODF) Program sponsored by Saskatchewan Agriculture between 1981 and 1986. The evaluation is intended as a basis for designing the technology transfer efforts associated with the Agriculture Development Fund announced in 1986. Our terms of reference are reproduced as Appendix A.

I.1 CONTEXT: AGRICULTURAL DEVELOPMENT FUND AND ITS PREDECESSOR PROGRAMS

The Agriculture Development Fund (ADF) is designed to finance research, development and demonstration activities and to support farmers in their efforts to improve their competitive position. The Fund was established in 1986 and runs for a five year period. A total of $200 million is committed over the five year period. The Fund comprises $150 million from the provincial government, contributions of up to $20 million from industry and producer groups and a committment of $30 million from the federal government through a sub-agreement on agriculture as part of the Economic and Regional Development Agreement (ERDA).

Part of the ADF replaced a program called "FarmLab". That program ran from 1981 to 1986. It was designed to join the expertise of Saskatchewan's farmers with the expertise of Saskatchewan Agriculture's staff, the University of Saskatchewan and Agriculture Canada to increase agriculture production while maintaining or increasing soil productivity. A total of $25 million was allocated for the five year program.

The FarmLab program had two major components which were closely related and operated on a complementary basis. One component was a contractual arrangement between the Provincial Government and the University of Saskatchewan to conduct research into specific agricultural issues identified on an annual basis. The second component was locally iniated on-farm demonstrations of recommendable agricultural practices.[1] The bulk of the five-year $25 million program budget was allocated to the research component. Approximately five percent was committed to technology transfer through the on-farm demonstration program, hereafter called the OFD program.

EXHIBIT 1

FarmLab Demonstration Program Model

FARM OPERATOR
- initiates on-farm demonstration
- completes "Project Proposal and Detailed Design" form
- conducts demonstration as part of farming practices

SASK. DEPT. OF AGRICULTURE STAFF
AGRICULTURE CANADA SCIENTISTS
AND UNIVERSITY OF SASKATCHEWAN
- review project proposals
- assist farmers in the implementation and operation of projects

AGRICULTURAL REPRESENTATIVE
- co-operate with farmer to develop demonstration
- consult with Department Specialist and agricultural scientist whenever possible
- solicit farmers for demonstrations when necessary
- submit proposal to the Agricultural Extension District Board for approval or rejection
- project leader and liaison with University and Canada Agriculture staff
- evaluate demonstration after it has been completed

DEPARTMENT SPECIALIST
- review and approve or reject proposals on technical grounds

AGRICULTURAL EXTENSION DISTRICT BOARDS
- establish priorities for locally initiated projects
- approve or reject proposals on basis of District priorities
- approve cost figures for projects
- request financial assistance from the Regional Council
- monitor all projects
- may appoint FarmLab Committees to promote and organize the program

REGIONAL COUNCIL
- form an Advisory Committee to the Sask. Department of Agriculture

Locally Initiated Demonstrations

The purpose of the locally initiated OFD program was to:

1) encourage development and implementation of local on-farm demonstration projects throughout rural Saskatchewan, which will promote technology transfer to meet Saskatchewan Department of Agriculture objectives; and

2) provide financial assistance to farmer co-operators or non-commercial local agricultural organizations for local on-farm projects, based on costs incurred above normal operating costs.

During the five years of the program's existence, just under 1,000 demonstrations were approved. Total approved expenditures for those demonstrations was approximately $591,000.

With the advent of the ADF, some important changes have been made. Funding levels have been increased to $200 million over five years, beginning with the 1986-87 fiscal year. The ADF also contains research, development and demonstration components. Technology transfer is taking a more prominent role and a much wider variety of transfer methods is being used. This evaluation sets out the lessons to be learned from the previous program as guidelines for the development of the ADF efforts.

I.2 PROGRAM MODELS

The program models for the FarmLab OFD Program and the ADF On-Farm Demonstration Program are shown in Exhibits 1 and 2 respectively. In FarmLab, the distribution of responsibilities was concentrated with the Ag Rep and the Agricultural Extension District Boards. The original program guidelines are attached as Appendix B. Consequently, setting of priorities and approval of demonstration projects was decentralized. In the ADF On-Farm Demonstration Program, the approval of projects and expenditures is centralized in the Review Committee. The Review Committee consists of the Director of Extension, Regional Directors, three Representatives from the Regional Extension Councils and the Secretary.

EXHIBIT 2

ADF On-Farm Demonstration Program Model

FARM OPERATOR
- initiates on-farm demonstrations
- completes ADF "Demonstration Application" form
- sets-up and operates demonstration site

AGRICULTURAL REPRESENTATIVE
- co-operate with farmer to develop demonstration
- work with Agricultural Extension District Boards to establish specific priorities in district
- review and approve project proposal
- discuss project with Agriculture Canada or University of Saskatchewan scientist

PROJECT LEADER
- complete agreement once proposal has been approved
- prepare progress and annual reports, results including an economic analysis, evaluation and recommendations
- consult with appropriate Department, University and Agriculture Canada staff

AGRICULTURAL EXTENSION DISTRICT BOARD
- establish specific district priorities and submit them to Regional Director
- may appoint ADF Committees to promote and organize the program
- review previous year's program

PROVINCIAL SPECIALIST
- may initiate projects
- inform Ag Reps of any projects located in their area

REGIONAL DIRECTOR
- summarize and forward to the Review Committee

REVIEW COMMITTEE
- approve or reject proposals
- recommend expenditures to the Minister of Agriculture

DIRECTOR OF EXTENSION
- chair the Review Committee
- provide an annual summary of all demonstration projects

The FarmLab Program used the Ag Rep network as a liaison between the farm operator at a local level and administration of the program at the district and provincial role. In the ADF Demonstration Program many of the Ag. Rep's responsibilities in the previous program are transferred to a Project Leader who may be either an Ag Rep, Regional or a Provincial Specialist.

I.3 PROGRAM ACTIVITY

A synopsis of program activity is presented in Exhibit 3. It shows:

- Gradual increases in the number of projects;
- No trend in program expenditures;
- No trend in average project cost; and
- Heavy emphasis on soils and crops

Other data indicated that the projects had been broadly dispersed throughout the province.[2]

It is very important to note that the average expenditure per project was under $1000.00. With a few large projects in the mix, it is apparent that the average OFD project cost the program $500.00 or less. By the standards of most demonstration programs, that is a minute sum. The program appears to have supported a great number of very inexpensive demonstrations. The financial size of the projects has important implications for the incentives offered the host co-operator, the scope of the innovation being demonstrated, and the extent to which adequate support is given by the projects to the critical communications functions. These issues will be discussed in more detail in the following chapters.

I.4 PURPOSE OF THE EVALUATION

This evaluation deals with the effectiveness of the FarmLab On-Farm Demonstration Program in encouraging the transfer of technology to the agricultural sector. The current ADF On-Farm Demonstration Program is similar in objectives and program structure. One major difference

Exhibit 3

Summary of FarmLab Demonstration Program Activities

Fiscal Year	# of Projects	Expenditures	Average $/project	%Crops/Soils:Livestock:Other
1981-82	26	13357.63	513.76	unknown
1982-83	160	115638.27	722.74	90:0:10
1983-84	249	145492.72	584.31	90:5:5
1984-85	250	125448.54	501.79	76:16:8
1985-86	205	182502.00	890.25	unknown
Totals	890	582439.16	654.42	

Source: Departmental Memorandum

Note: in 1986-87 the Agriculture Development Fund estimates 119 demonstrations with expenditures at $213,106.00. The average cost per demonstration is $1,790.81.

between the two programs is the greater amount of funding available for research, development and technology transfer under the ADF Program.

Evaluation of FarmLab's demonstration experience is intended to enhance the effectiveness of the ADF's technology transfer function. The importance of the technology transfer function is highlighted by the need to ensure that ADF's enhanced research and development effort is effectively transmitted to the farm level.

I.5 EVALUATION MODELS OF TECHNOLOGY TRANSFER

Technology transfer is the process by which an innovation is communicated through certain channels over time among members of a social system. The innovation can be tangible such as a new product or intangible such as a new process or idea. The objective of technology transfer is to facilitate the diffusion of the innovation so that it will be adopted by a segment of society. In this section, the various elements of a technology transfer model are developed for later use in assessing the extent to which the OFD program made use of existing knowledge to maximize effective technology transfer.

The section begins with a discussion of the classical innovation model (I.5.1), then applies it specifically to agricultural innovation (I.5.2).

I.5.1 TECHNOLOGY TRANSFER MODELS

Much of the early theory on technology transfer originated in the fields of market research and consumer behaviour. The basic findings are:

1) there are definite stages an individual goes through when considering adopting an innovation;

2) the potential adopter has certain characteristics which affect how readily he or she will adopt, and

3) the characteristics of an innovation influence the rate of adoption.

These findings have been expanded into the innovation, diffusion and adoption theory. This theory is a description of how technology is transferred and adopted. This section details the major findings of the innovation, diffusion and adoption theory. [3]

I.5.1.1 Stages of Adoption

Individuals go through stages of acceptance in the process of adopting a new product. These stages are:[4]

1. Knowledge - an individual is exposed to the innovation's existence and gains initial understanding of how it functions.

2. Persuasion - the decision-maker forms a favourable or unfavourable attitude toward the innovation.

3. Decision - the decision-maker engages in activities that lead to a choice to adopt or reject the innovation.

4. Implementation - the decision-maker puts the innovation to use.

5. Confirmation - the decision-maker needs reinforcement of his or her decision.

The adoption decision is not an instantaneous act; rather it is a process that unfolds over time, in a series of actions that follow a common pattern. Therefore a technology transfer model must provide the communication and reinforcement necessary in each stage of adoption in order to maximize its chances of success.

I.5.1.2 Adopter Types

People differ markedly in their penchant for trying new innovations. Therefore, the potential adopters can be segmented into five types

based on their willingness to adopt new products or ideas. There are "innovators" (defined as the first 2.5% of the individuals to adopt a new innovation), "early adopters" (the next 13.5% or so), "early majority" (the next 34%), "late majority" (the next 34%), and "laggards" (the last 16%). While the percentages are somewhat arbitrary, the five-stage conceptual model and the approximate sizes of each group has strong intuitive appeal and research confirmation. Members of a particular category have been known to exhibit quite similar socio-economic, personality and communication behavior traits.

Innovator types are venturesome in trying new ideas. They are willing to accept the risk that the innovation may be unsuccessful.

The early adopters are the most influential group in whether the innovation will be adopted by a large spectrum of potential adopters. They are often sought out to serve as change agents or champions for a new innovation.

The early majority types are less likely to be viewed as adoption leaders, but they serve as a link between early adopters and other groups. They provide the interconnection that eventually results in an innovation being fully diffused throughout a social structure.

The late majority individuals exhibit a fair degree of skepticism and caution in assessing innovation. There must be little remaining uncertainty associated with the innovation before late majority types will adopt.

Laggards are the last group to adopt. They are often suspicious of innovations and change agents. Their adoption behavior lags far behind their awareness of a new idea. In some cases a few laggards will refuse to adopt the innovation regardless of the benefit because of an unwillingness to change. An example of this behaviour might be a farmer unwilling to use a tractor in regular farming practise.

1.5.1.3 Adoption Factors

Technologies can be differentiated in many ways such as complexity (high - low technology), industry (electronics, aerospace, medicine, agriculture, etc.) and by characteristics of the potential adapters

(economic, social, geographic). The basic elements of the technology transfer model, specifically adopter types, stages of adoption and adoption factors are present in any mode of technology transfer. The variations in technology create variations in the applicability of the basic model, particularly with respect to key adoption factors. Consequently, the technology transfer models for different technologies are unique subsets of a technology model.

Typically, the number of users of an innovation grows slowly at the start, increases rapidly as the early majority signs on, and then decreases its rate of growth as full equilibrium demand is reached.[5] Consequently, the acceptance curve is S-shaped as shown in Exhibit 4. There are three factors determining the speed at which diffusion proceeds, compressing or stretching out the S-shaped curve: (1) the long run advantage of the new product or process over older ones; (2) the transition costs and functions, on the one hand, and the costs and dangers of maintaining the status quo on the other; and (3) the uncertainty about the superiority of the innovation and the ease or difficulty of overcoming these uncertainties.

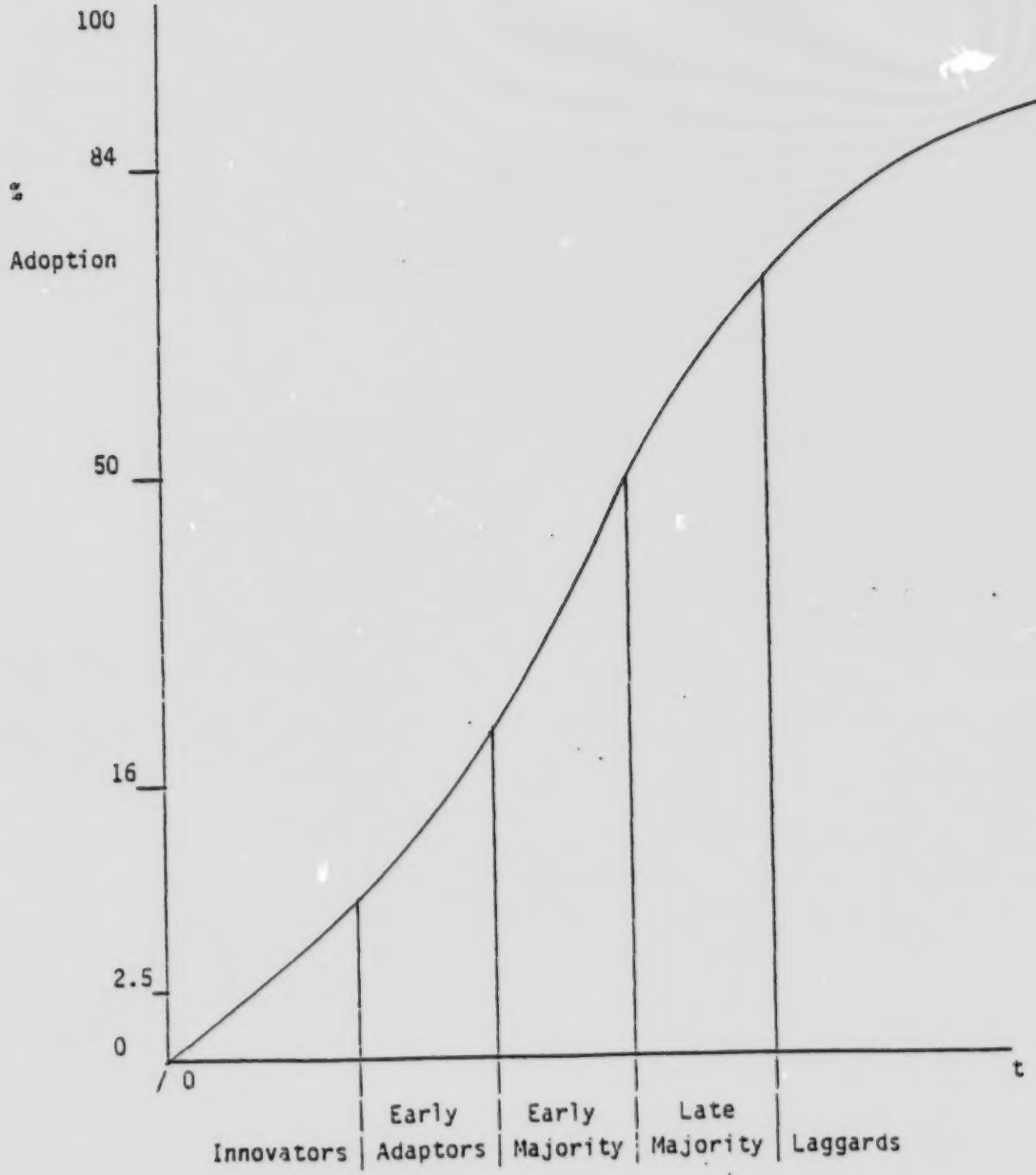
Long Run Profitability or Utility. If an innovation is better or provides a cost reduction, it will eventually be used in all or most situations where it retains a positive net value. An innovation which is highly profitable will be adopted at a much faster rate than if it is only marginally profitable.

Transition Frictions and Pressures. Relative profits of an innovation must be adjusted for the alteration of related factors such as capital stock and education. The necessity of acquiring new physical capital frequently makes rapid transition uneconomical. The cost of adopting the innovation and the resulting changes in operating costs are compared to the benefits of the innovation. The level of physical capital and the back-pay period affect the adoption rate of an innovation.

The adoption will be delayed if the new technique requires new kinds of knowledge or patterns of behaviour which are costly in terms of resources, effort or time. As with innovations requiring new capital,

Exhibit 4

The S-Shaped Curve of Technology Adoption



those requiring significant special education or training must win their way against older technologies for which costs already have been incurred.

Finally, the speed of diffusion may be slowed by simple lethargy. The pressures to adopt innovations rapidly are greater in competitive markets than in sheltered ones.

I.5.1.4 Uncertainty and Its Resolution

Some innovations, representing only marginal modifications from existing equipment, may be relatively easy to demonstrate and evaluate. For major innovations, it may be considerably more difficult for sellers to demonstrate that a potential user could effectively and beneficially adopt the new technique or product, or for the potential users to make their own evaluation with a high degree of confidence.

Three factors influencing the resolution of uncertainty play a major role in determining the pace of adaptation:[6]

(1) The extent to which an innovation may be tried out on a small scale;
(2) The extent to which potential users include a group with education and training which permits information about the innovation to be decoded and understood and experiments to be performed effectively and confidently; and
(3) The strength of the information dissemination system.

Several studies indicate the importance of a technically sophisticated group which is interested and capable of evaluating the new innovation.[7] The early adopters of hybrid corn tended to be farmers with higher than average education who read technical journals and bulletins. Often, they also had contacts with the universities.[8]

After the innovators have set an example, less venturesome and knowledgeable colleagues follow. The late adopters of hybrid corn mentioned the influence of direct contact with the early users, or with salesmen and extension agents who pointed out the experience of the early users. There is little evidence that the late majority heard of

the innovation much after the early majority. However, later users were less able to evaluate claims made through the communication agents. Those sources were often not considered reliable unless their message was backed by one or more members of a peer group, particularly by a member considered to be an expert.[9]

I.5.2 Agricultural Technology Transfer Models

Much of the theoretical research on agricultural transfer models has been based on the transfer models identified in marketing research. Boren and Beal classified farmers as innovators, early adopters, majority, late adopters and non-adopters. Fornatsky, et al. developed a five stage model based on a synthesis of other research. The five stages are: awareness; matching/selection; adoption commitment; implementation; and routinization.[10]

I.5.2.1 Adoption Factors In Agricultural Technology Transfer

This section describes the adoption factors which are inherent to agricultural technology transfer. The key factors in determining the effectiveness of the transfer process are outlined below.

- The ability to identify local needs and resources has a special impact on the agricultural sector because target markets can be finely segmented and localized. There must be a linkage of the specific product introduction plan with a broader development strategy to produce the most substantial results. Many efforts will be successful if they are initiated and implemented locally.[11]

- Utility, economics, and long-run profitability form an integrated package. Success is dependent on both technical and financial performance.[12]

- The transition frictions and pressures inherent in the agricultural sector are unique. In traditional market theory, the early adopters have a cost advantage if the product is in demand and is economical. This advantage will force others to adopt or

lose market share. However, in the agricultural sector (specifically at the farm/producer level), markets and output prices are often fixed so competitive incentives are reduced. Farmers are less concerned about market share and, consequently, adoption for competitive reasons is less of an incentive. However, adoption to reduce input costs or increase value-added is an enduring incentive.

- The amount of uncertainty surrounding the innovation is a key factor. Many farms do not have the resources and information required to conduct rigorous evaluations of new products. Therefore other methods of reducing uncertainty, such as peer and expert opinion, practical demonstrations, and test runs, are important.

- The characteristics of the technology and the nature of the technology transfer system strongly influence both the rate and the level of adoption. When a new technology simply involves substitution of one input for another, it tends to be adopted quickly. Speed of adoption is also increased in proportion to the farmers' perception of the need for change. Well-developed research, testing, and demonstration systems which involve both public and private agencies and include farm participation enjoy a high level of credibility among farmers. When all of these features are combined with simplicity and low relative cost, adoption of the innovation can be expected to take place quickly.[13]

- The marketing literature has shown that the adoption of new technology can be either demand driven or supply driven. In agriculture however, almost all adoption is driven by demand. In other words, the end user (farmer) must demand the product. This underlines the need for participation of farmers in developing and transferring technology.

- In the agricultural sector, public and quasi-public organizations play a large role in developing technology. The current division of Canadian agricultural research funds is:[14]

50% federal
35% provincial and university
15% industry.

The policies of the federal government have a large influence on agricultural research. The federal government is currently transferring responsibility for agricultural research more towards the provincial and private sector. (Western Producer 21/05/87).

Public policies can influence technology transfer in agriculture by:

1) affecting the introduction date (the earlier a beneficial new technology is introduced, the greater the benefit-cost ratio will be); or
2) improving the use of technology through the provision of technical support services.

In addition, governments have responsibility for regulatory authorization, some market coordination and much communication.[15]

In summary, key factors promoting effective technology transfer in the agriculutural sector are as follows:[16]

1) producers are requesting the innovation (or the results thereof)
2) producers were involved in development research
3) the technology is physically visible
4) the economic advantage is clear
5) target users are well defined
6) the technology is simple, with limited incremental skills required
7) existing financial resources are adequate
8) return on investment comes quickly
9) target users have the skills and resources required.

1.6 KEY ISSUES

The key issue in this evaluation of the demonstration program is whether or not on-farm demonstrations can play a more effective role in transferring new technology into the farm community. In evaluating the

program in terms of this issue a number of other related issues must be considered. These issues include:

- Are changes to the demonstration process needed, including larger and longer demonstrations; moving or fixed sites; or multiple demonstration sites?
- Can the communication channels be improved?
- Can the administrative structure be revamped to be more effective in technology transfer?
- Is the balance of expenditures between technology transfer and research appropriate?
- Is better project evaluation required? If so, at what level should the evaluation be conducted and what information is required?
- Can changes in the selection of technologies and/or participants in the demonstration program make the technology transfer process more effective?
- Should demonstrations be oriented towards technical (scientific) or market results?
- Is a change in the emphasis on agricultural sectors required?

These issues are the focus of the following chapters.

I.7 EVALUATION METHODS

The evaluation used an integrated multi-method design to address the issues from a variety of angles. Following the evaluation assessment conducted earlier, a detailed literature review was completed. The review focussed on specific hypothesis about optimizing technology transfer in the agricultural sector. Those hypotheses were reformed into the evaluation models discussed above.

Program models were developed on the basis of government documents, files and interviews with officials. These models identified the actual and intended operation of the program.

Preliminary assessments of the existing transfer system were based on a comparison of the evaluation and program models, i.e., the congruence between the published literature on technology diffusion and the practices of the program. Discrepancies were used as discussion points in interviews with a wide range of participants and other authorities, as described in Appendix C. In some instances, the discrepancies were resolved through refinements to the program (operational) models; in other circumstances, the general evaluation models were changed to more precisely reflect the particulars of a special crop or region. Those that remained as anomalies challenge either the validity of the existing knowledge base or the presumed effectiveness of the program.

A thorough review of project files was the starting point for both a review of program operations and the preparation of a survey database. A survey of farmer OFD hosts was conducted, as detailed in Appendix E. It resulted in 157 completed records, with a refusal rate below 3%. Additional interviews from the pretest and other sources were used in the qualitative analysis, but excluded from the statistical results.

The survey asked respondents about themselves, their farm operations, and their experiences as demonstrators. Questions were designed to represent key concepts in the evaluation and program models. The whole survey was designed to be interesting to respondents and to give them a chance to tell their story. The extremely high completion rate and low refusal rate suggest it was successful in capturing the ex-hosts' interest.

Case-by-case analysis of the survey data and of the project files suggested several patterns among the demonstrations and hosts. In order to get a more detailed view of the role of the host in the diffusion process, ten case studies were conducted. Starting with the file and survey data, the case studies involved in depth interviews with the hosts, their Ag. Reps., neighbours, and others who may have been influ-

ential in assessing the value of the demonstrations. The case study methodology is also described in detail in Appendix B.

Extensive statistical analyses were performed on the survey data. The analyses included univariate, bivariate and multivariate procedures designed to test numerous evaluation issues and hypotheses. External references compared the FarmLab data to others from Statistics Canada, Saskatchewan Wheat Pool, the United States Department of Agriculture, and numerous other published sources.

II FARM-LEVEL PROFILES

In this chapter, the characteristics of past on-farm demonstrations (OFD) are compared with those suggested by the evaluation models. Technology transfer models suggest that demonstration hosts should be innovators or early adopters if the program is to function effectively. Ideal hosts, therefore, should differ from the average Saskatchewan farmer in several important ways. Two key issues are addressed:

- Was the previous on-farm demonstration program successful in identifying the right people to serve as the demonstration hosts?
- Can the criteria for participation in the program be improved?

The chapter focusses on the farm/host level. It does so from several perspectives:

- Demographic characteristics: Do OFD hosts differ from average farmers? Do OFD hosts carry classic innovator traits?
- The process of demonstration: Was the motivation and behaviour of the OFD hosts well-suited for the program's objectives? Were commmunication patterns appropriate for an innovator group?
- Results: Was the innovation successful in scientific, market, and economic respects?
- Communications: Were the OFD hosts tapped into effective communication channels? Did the demonstrations get the right type of coverage?
- Psychographics: Were the characteristics of the OFD hosts typical of effective transfer agents?

The chapter presents the results of a series of multivariate analyses designed to separate the characteristics of sub-groups within the OFD host population. Reviews of individual cases, program procedures, and bivariate data suggested that the survey of OFD hosts had uncovered more than one type of host. Specifically, it was felt that one or more types of innovators,

and early adopters might have been included, along with some farmers who really didn't belong on the front end of a technology transfer effort.

This chapter is based primarily on the special survey of OFD hosts conducted for this evaluation. A copy of the survey is contained in Appendix E.

II.1 DEMOGRAPHIC PROFILES OF THE HOSTS

According to the literature, effective innovators differ significantly from their peers. They have special attitudes toward change and risk which set them apart. They also share extreme values on education (especially self-directed), mobility, and communication. Beyond that, there are several subgroups, such as the wealthy (who can afford more risks) to the poor whose constant experimenting produces enough losses to absorb the benefits of successes. We also hypothesized that communication patterns with "influentials" would have to be high for effective diffusion, that the innovator who is not socially accepted would be so lacking in credibility as to be almost counter-productive despite his inquiring and innovative nature. The following analyses tests the degree and direction of differences between OFD hosts and the normal farming population, and tests the assumptions that all hosts were equally qualified as diffusers of agricultural change.

II.1.1 Distribution by Region

The distribution of the 157 survey respondents by region of the province and by year is shown in Exhibit 5. With the exception of the East Central region, all are well represented as was intended by the sampling framework. The distribution from year to year, is however, very uneven. That unevenness is an artifact of program development rather than an indicator of shifting attitudes toward innovation.

II.1.2 Age

The distribution of the age of the demonstrators and for the population of farm operators in Saskatchewan (from Statistics Canada data) is shown in Exhibit 6. The age of the demonstrators is biased towards the 25 to 44 age group. The percentage of demonstrators 65 years of

Exhibit 5

Survey Participants by Region

Region

Year Approved	North West	Central West	South West	North East	Central East	South East	Total
1981	12	2	0	0	0	1	15
1982	0	0	3	1	2	5	11
1983	10	5	0	0	3	3	21
1984	3	4	22	4	3	6	42
1985	3	19	20	15	2	9	68
Total	28	30	45	20	10	24	157

Source: Survey of Demonstrators, March, 1987. Region Identification.

Exhibit 6

Farm Operators Classified by Age (%)

	ADF (%)	SC (%)	CHANGE (%)
<25	0.6	4.3	- 86.0
25-34	29.9	21.5	+ 39.1
35-44	35.7	22.1	+ 61.5
45-54	15.3	16.2	- 5.6
55-64	15.9	17.7	- 10.2
>64	2.5	18.2	- 86.3

Sources: ADF = Survey of Demonstrators, March 1987. Question #80.

SC = Statistics Canada; Canada Agriculture 1986 Summary Tabulations, Canada - Provinces, (Saskatchewan), June 3, 1986. Table 1.

age or older is significantly lower than the percentage of Saskatchewan farm operators in that class. The profile of demonstrators, therefore, emphasizes younger farmers and confirms the literature on this point.

II.1.3 Birth

Ninety-five percent of the respondents were born in Saskatchewan. Eight of the 157 were born outside of Saskatchewan. Of these eight, four were born in other areas of Canada and four were born outside of Canada. The demonstrators who were born outside of Canada are all long-time residents of Canada. **Most diffusion models posit mobility as a carrier of innovation. As represented by migration, however, mobility is not a factor with this group.**

II.1.4 Education

Exhibit 7 shows the education levels of the demonstrators and compares them to the Saskatchewan population of farm operators (1981 Statistics Canada data). **The table indicates that the participants in the On-Farm Demonstration Program were, in general, much better educated than the general farm population.** This finding supports many others in the diffusion literature which see education as a key factor in promoting innovation.

II.1.5 Income

The income distribution of the demonstrators surveyed is compared with the income distribution of Saskatchewan farm operators (1981 Statistics Canada data) in Exhibit 8. The results are somewhat puzzling since the demonstrators appear to represent over-weighting of the extremes of the farm income range. Demonstrators appear to be about twice as likely as average farmers to be either losing money - or doing very well. Average income groups are under-represented in the demonstration sample.

It should be noted that the two sources are based on quite different years and somewhat different questions. In Exhibit 9, it is shown that

Exhibit 7

Education Level of Farm Operators +

Education Level	ADF (%)	SC (%)	Change (%)	WP (%)
< Grade 9	11.5	43.5	- 73.6	12.84
Some high school	24.2	29.8	- 18.8	
Grade 12	15.3	20.0	- 23.5	50.89
Technical Institute	29.3	2.9	+ 910.3	16.64
University	19.7	3.6	+ 447.2	15.53
	100.0	99.8		95.90++

++ Wheat Pool Data Incomplete

+ Based on highest education level

Sources: ADF = Survey of Demonstrators, March 1987. Questions #68-70.

SC = Statistics Canada (1981); Agriculture - Population Sample Data Base Saskatchewan Part 1. Table 1, p. 1-3.

WP = Saskatchewan Wheat Pool; Member Survey, March, 1987. Question E-5C.

Exhibit 8

Distribution of Net Farm Incomes (%)

Net Income (in $ thousands)	Survey (1987) ADF (%)	+ Cum	Survey (1981) SC (%)	+ Cum
< 0	17.4	17.4	9.1	9.1
0 - 4,999	13.9	31.3	29.8	38.9
5 - 9,999	12.2	43.5	18.8	57.7
10 -19,999	20.5	64.0	21.9	79.6
> 20	36.1	100.1	20.3	99.9
	100.1		99.9	

+ smoothed, using mid-point estimates

Sources: ADF = Survey of Demonstrators, March, 1987. Question #64.

SC = Statistics Canada (1981); Agriculture - Population Sample Data Base (Saskatchewan) Part 1. Table 1-3.

Exhibit 9

Typicality of 1986 Income Results

Classification of 1986 Net Income	% of Demonstrators
Higher than recent years	8.6
Typical for recent years	32.7
Lower than recent years	58.7

Source: Survey of Demonstrators, March, 1987. Questions #65-66.

most respondents felt that the reference year, 1986 to have been poorer financially than recent years. Further analysis of these financial issues is developed later in this report.

II.1.6 Farming Experience

Exhibit 10 is a summary of the years demonstrators have been farming at their present location. **The farmers who took part in the demonstrations were well established.** Only 1.3% of them had less than five years of farming experience at their present locations. There is a concentration of demonstrators with ten to fourteen years of farming experience in their present location and a concentration of those with twenty-five or more years experience. This split if significant, may be related to two different generations present in the sample.

Only twenty-six of the demonstrators had farmed at any other location. The total farming experience of the demonstrators is shown in Exhibit 11.

II.1.7 Ownership

The forms of ownership of demonstration farms are shown in Exhibit 12. The data are compared to the ownership distribution data on Saskatchewan farms according to Statistics Canada and the Saskatchewan Wheat Pool. **There were proportionally fewer farms classified as sole proprietorships participating in the demonstration program while there were more of the complex ownership forms such as partnerships and corporations. The degree of complex ownership structures is an indicator of both farm size and adaptation to new and complex ideas.** (Notably, the survey data agree much more closely with the Wheat Pool than the Statistics Canada data, but still show a higher level of corporate farms.)

II.1.8 Type of Farming Operation

The type of farming operation of the demonstration farms, based on output is shown in Exhibit 13. **The farms participating in the program were strongly biased towards the traditional forms of agriculture such**

Exhibit 10

Farming Experience at Present Location

# of Years	Frequency*	% of Demonstrators	Cumulative %
< 5	2	1.3	1.3
5 - 9	24	15.3	16.6
10 - 14	51	32.4	49.0
15 - 19	19	12.1	61.1
20 - 24	13	8.3	69.4
> 25	48	30.6	100.0
	157	100.0	

* Response to Questions #1 and #3 are added to give total farming experience for all demonstrations.

Source: Survey of Demonstrators, March, 1987. Questions #1 and #3.

Exhibit 11

Total Farming Experience of Those That Farmed at Other Locations

# of Years	Frequency*	% of Demonstrators
< 15	5	19.2
15 - 19	3	11.5
20 - 29	11	42.3
≥ 30	7	26.9
	26	100.0

* sample population is the number of demonstrators who have farmed elsewhere (N = 26).

Source: Survey of Demonstrators, March, 1987. Question #3.

Exhibit 12

Form of Farm Ownership (%)

	ADF	WP+	SC
Sole proprietor	67.5	68.7	85.9
Partnership	19.7	20.9	10.0
Corporation	11.5	7.3	3.5
Other ownership	1.3	1.7	0.6
	100.0	98.6++	100.0

\+ Single Operation and Husband and Wife categories were grouped as Single Proprietor.

++ Wheat Pool Survey Information incomplete.

Sources: ADF = Survey of Demonstrators, March, 1987. Question #7.

WP = Saskatchewan Wheat Pool; Member Survey, March, 1987. Question #A-4.

SC = Statistics Canada; Canada Agriculture 1986 Summary Tabulations, Canada-Provinces, (Saskatchewan), June 5, 1986. Table 3.

Exhibit 13

Type of Farming Operation

Type of Operation	Frequency	% of Demonstrators
Cereal only	31	19.7
Livestock only	6	3.8
Special crops only	0	0.0
Other only	1	0.6
Cereal and special crops	16	10.2
Cereal crops and livestock	80	51.0
Cereal crops and other	2	1.3
Special crops and other	1	0.6
Livestock and other	2	1.3
Cereal, special crops and livestock	17	10.8
Cereal, special crops and other	1	0.6
	157	100.0

Source: Survey of Demonstrators, March 1987. Question #4.

as cereal, livestock, and mixed cereal and livestock. The data suggests that farms with diverse production (i.e., special crops and livestock) were more involved in the Demonstration Program than farms which are not diversified. Unfortunately, comparable data on the general farm population were not available so difference tests could not be used.

II.1.9 Farm Size

Demonstration farms are significantly larger than the Saskatchewan average with very few less than a section in size. As shown in Exhibit 14, at the upper end of the scale, more than three times as many respondents operated farms larger than 2,240 acres in comparison with the provincial average. As noted above, this result is apparently not due to over-representation of large livestock or wheat farms.

II.1.10 Dependence on Farm Income

Unlike the Saskatchewan farm population as a whole, most respondents derived more than 90% of their household income from farming. As shown by Exhibit 15, this pattern indicates that demonstrators were certainly not hobbyists, but dedicated farmers.

II.1.11 Computer Application

A total of 15.3% of the participants use a computer in their farming operation. In addition, 16.6% plan to use a computer in the near future. This indicator confirms a strong orientation toward new technologies in the demonstrator group. Statistics Canada (1986) data show that only 2.4% of farm operators in Saskatchewan use computers.

The fact that computer usage among demonstrators was much higher than average for the farming population is significant. Computer usage was included in the survey as an indicator of adaptation to modern technology in general. It is noteworthy that only half of those inclined toward computer usage actually use them.

Exhibit 14

Farms Classified by Size %

Area (acres)	ADF	SC	Difference (ADF vs. SC)
0 - 69	0.6	2.6	- 76.9
70 - 559	5.8	33.2	- 82.5
560 - 1,119	24.8	31.9	- 22.3
1,120 - 2,239	41.4	24.7	+ 67.6
2,240 - 3,519	19.1	5.1	+ 274.5
> 3,520	8.3	2.4	+ 245.8
	100.0	100.0	

Sources: ADF = Survey of Demonstrators, March, 1987. Question #5.

SC = Statistics Canada; Canada Agriculture 1986 Summary Tabulations, Canada-Provinces, (Saskatchewan), June 5, 1986. Table 16.2

Exhibit 15

Percentage of Household Income From Farm Operations (%)

Income %	ADF (%)	SC* (%)	Difference (ADF vs. SC)
< 50	8.4	22.1	- 62.0
50 - 90	27.3	53.3	- 48.8
> 90	64.3	24.6	+ 161.4

* the Statistics Canada data are categorized as

Class	SC (%)
< 50%	22.1
50 - 74%	16.4
75 - 100%	61.5

In smoothing the data it was assumed that distribution was uniform in all classifications.

Sources: ADF = Survey of Demonstrators, March, 1987. Question #64.

SC = Statistics Canada (1981); Agriculture - Population Sample Data Base (Saskatchewan) Part 1. Table 8-23.

II.1.12 Composite Profile

From the above analyses, a composite profile of the respondents can be constructed. Respondents are typical of Saskatchewan farmers in several respects. Most of them are sole proprietors or part of husband-wife partnerships. They participate in many forms of agricultural production with about half operating mixed cereal and livestock farms.

Significant differences appear, however. Demonstrators are generally more highly educated than average. They tend to be younger than average. Almost all have been born, raised, and educated in this province and most have farmed only on their present farm. Respondents were both more and less successful financially than average, with double the population percentages losing money and double well above average. Almost all appear to be career farmers with all their adult lives spent in farming. There is a tendency toward more complex ownership forms, such as corporations, but only a minority of demonstration farms fall into this category.

Respondents operated larger than average farms and derived a much higher percentage of their incomes from farm operations than the Saskatchewan average.

Taken together, these findings suggest a demonstrator group which is young, dedicated, relatively well-trained, and more successful than average. In general, therefore, it appears to be skewed toward the traditional innovator profile.

Notably, however, the differences between the respondents and their neighbours are less than perfectly clear cut. It appears that most demonstrators are typical of the average Saskatchewan farmer while a few stand out as stereotypical innovators.

In this respect, the program does not appear to have been successful in identifying a distinct group of diffusion leaders, although some have been uncovered. Further analyses are necessary to determine if: 1) a distinct group of innovators actually exists and was just not well tapped by the old OFD program or 2) the accepted models of diffusion do not apply in this sector of the province. Preliminary conclusions,

Exhibit 16

Duration of Demonstrations

# of Years	Frequency	% of Demonstrators
1	79	50.3
2	38	24.2
3	19	12.1
4	6	3.8
5 or more	15	9.6
	157	100.0

Source: Survey of Demonstrators, March, 1987. Question #11.

based on these results, several interviews, the case studies, and a review of cooperator selection procedures, suggest that the program was not very clear about useful demonstrator characteristics. It was likely, therefore, to have solicited a wide range of hosts rather than a carefully targetted advance guard.

II.2 PROCESS OF DEMONSTRATION

The ADF Evaluation Survey addressed several issues associated with the demonstration process, from its duration to the hosts' sources of information and motives. Attitudes of the hosts toward program management and certain program features such as financial incentives and technical assistance were also assessed. In this section, the attitudes of the OFD hosts toward the program are reported.

II.2.1 Duration

Exhibit 16 shows the duration of the demonstrations. **Almost half (50%) lasted only one year and 74.5% had a duration of two years or less.**

Seventy-two percent of the projects lasted as long as planned with 14% still on going. Fourteen demonstrations were terminated early. Of those fourteen demonstrations, eight were terminated because of the weather. Poor management planning was cited as a factor in only one case which ended early.

II.2.2 Communication about the Demonstration Program

Exhibits 17 and 18 show the sources of farmers' initial contacts with the program. **The Agricultural Representative (Ag Rep) was the most widely used channel of communication.** Approximately 56% of the demonstrators first heard about the program from the Ag Rep and 42.7% first got the idea for their demonstration projects from the Ag Rep. Other sources of ideas for demonstrations included publications (13.4%) and the farmer himself or herself (12.7%). Other sources of information about the program were diverse. **These findings tend to confirm the crucial role of the Ag Reps as general purpose information brokers in the diffusion system.**

Exhibit 17

Source: of Initial Information About the Program

Information Source	% of Demonstrators
spouse	0
ag rep	56.1
newspaper	4.6
magazine	0.6
television	1.3
radio	3.2
other farmer	4.5
don't recall	2.5
neighbours	0.6
other	26.8
	100.0

Source: Survey of Demonstrators, March, 1987. Question #15.
N = 157

Exhibit 18

Sources of Ideas for Demonstration Projects

Source	% of Demonstrators
self	12.7
university researcher	0.6
ag rep	42.7
district council member	3.8
regional council member	0.6
provincial specialist	5.1
relative who also farms	1.3
other farmer	5.7
neighbours	1.9
publication	13.4
other	12.1
	100.0

Source: Survey of Demonstrators, March, 1987. Question #14.
N = 157

II.2.3 Motivation

Many of the demonstrators (88.5%) were motivated to participate because they wanted to test one idea to see if it would work on their own farm. Participation in order to test an idea for several farmers in the area was cited as a motivating factor by 32.5% of the demonstrators and 30.6% were also motivated by the Ag Rep or Provincial Specialist. (Multiple responses were allowed.) **The findings show the dominant influence of personal involvement, but also demonstrate significant levels of community orientation.**

The possibility that those motivated by the "System" (i.e., Ag Reps, etc.) might be more passive than the others was tested. While the results are not crystal clear, they suggest that the system-motivated group was well recognized within the community. Rather than being under-motivated, they were the natural places for the Ag Reps to seek support. While perhaps not as innovative as other participants, these people can be seen as opinion leaders, influential members of the early majority of potential adopters.

II.2.4 Opinion of the Demonstrators

Almost all (97.8%) of the demonstrators felt that the people responsible for the program were efficient in handling their applications. Ninety-six percent felt that the demonstration was well worth the time and money put into it and 93.6% felt that they benefitted personally from holding the demonstration. Their favourable opinion of the program is reflected in the fact that 93% indicated that they would be willing to host another demonstration.

Opinions on whether or not the demonstrators had preconceived ideas on the results of the demonstration and whether the results were as expected, were mixed.

Sixty-eight percent of the demonstrators felt that area farmers benefitted from the demonstration.

II.2.5 Compensation and Assistance

Ninety percent of the demonstrators received financial compensation for the non-labour expenses associated with the demonstration. **Ninety-one percent of those compensated felt that the level of compensation was adequate and 6.3% felt that it was very generous.** Only 4.2% felt that the compensation was not adequate.

These are important points since demonstration hosts were only compensated for receipted expenses such as seed, fertilizer, rental of specialized equipment, or extraordinary services (e.g., veterinary test procedures).

Hosts' time, equipment, and facilities were not compensated. The average project was worth around $500, over its duration, to the host. In many cases, the market value of the hosts' contributions would have been ten times that amount or more. Yet very few complained about the lack of compensation.

This finding confirms the validity of the program's assumption that intangible benefits, such as advanced technical knowledge and community prestige, compensate participants adequately for their contributions. That result should not be surprising - all respondents had agreed to participate under those conditions. Few were disillusioned.

Concerns must remain, however, about the extent to which good demonstrators shied away from the program because of the lack of compensation. Especially since the OFD hosts do not clearly separate out as a distinct innovator group, it remains possible that this program feature may be causing a dilution of the quality of participants. Without access to a control group of non-participants, that possibility could not be tested in this evaluation. For larger demonstrations in particular, some compensation for management and extraordinary resource usage is likely to be necessary to ensure quality control.

A total of 84.7% of the demonstrators felt that technical assistance provided through the program was adequate.

II.3 RESULTS OF THE DEMONSTRATIONS

Another battery of questions in the Evaluation survey was concerned with the rate of diffusion of the innovations being demonstrated.

II.3.1 Success of the Demonstrations

A total of 63.1% of the survey respondents felt that their demonstration produced clear results and definite conclusions. The results were partly clear for 15.3% of the participants and 14.6% felt that the results were inconclusive and definite conclusions could not be drawn. Seven percent of the demonstrations had not reached completion stage so results could not be assessed.

Almost half (49.7%) of the participants felt that the innovation they were testing was successful; 38.2% felt it was somewhat successful and 7.6% felt it was not at all successful. Seven of the demonstrations were not complete.

For the seventy-seven participants reporting less than complete technical success, the explanations are shown in Exhibit 19. Of the documented reasons for poor results, **weather was the principal problem.** Causes which are visibly man-made appear to have affected only seven of the 157 demonstrations or 4.5%. That figure is probably under-estimated due to respondents' tendencies to consider the demonstrations a success or to blame external factors for failure. Even if the number of demonstrations adversely affected by poor design or management were raised to 20%, **the program should still be considered very successful for an experimental, one-of-a-kind effort.**

II.3.2 Benefits of the Innovation

Seventeen percent of the respondents felt that all of the farmers in their district could benefit from the innovation tested and 60.0% felt that some or most would benefit. At the start of the innovation, they felt, 88.1% of the district farmers were not using the innovation or it was used sparsely. Some of the farmers were already using the demonstration innovation in 10.5% of the cases and most farmers were using the innovation in 1.3% of the cases.

Exhibit 19

Reasons for Lack of Success

	% of Demonstrators not fully successful
drought	23.4
poor technical assistance	1.3
winter kill	6.5
longer-wider test needed	7.8
too expensive	6.5
poor germination	1.3
other	6.5
no comment	46.8
	100.1

N = 77

Source: Survey of Demonstrators, March, 1987. Question #25.

Despite the fact that 83.0% of the participants felt that some, most or all of the district farmers could benefit from innovation they tested (Q. 26), only 30.5% of the respondents indicated that they though some (25.5%), most (4.3%), or all (0.7%) of their neighbours had adopted the practice within a year of the demonstration. While 29.8% indicated that none of the farmers that could benefit in their Ag Rep District were using it one year after the demonstration ended, only 10.9% thought that would be the case five years after the demonstration. Conversely, 56.7% felt that some (37.7%), most (17.8%) or all (0.6%) would be using it five years after (Q. 29). **These findings suggest that the demonstrators feel that other farmers are reluctant to adopt new innovations even if they are beneficial.**

II.3.3 Rate of Diffusion of Innovation

The findings also help to map a general rate of diffusion. If we accept the "some" response as a mid-point on the scale presented to the respondents in the survey, then one interpretation of the results suggests:

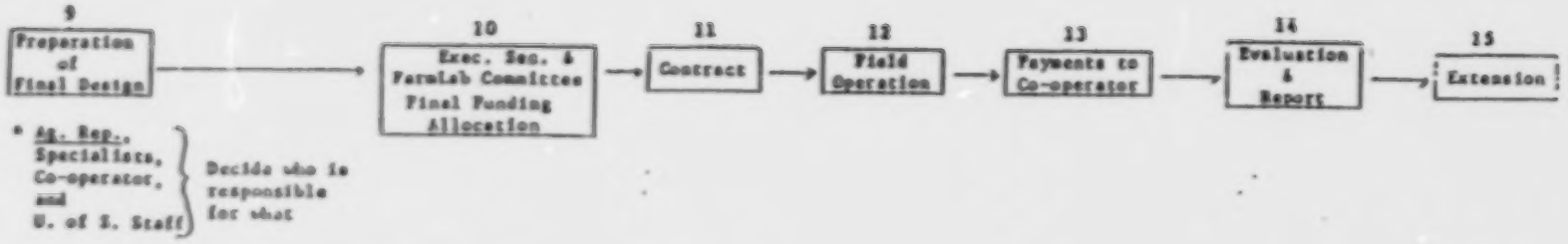
12% adoption at the time of demonstration
30% adoption one year after demonstration
60% adoption five years after demonstration

The inverse relationship, no adoption at all, shows a similar pattern:

51.3% reporting zero adoption by potential users in their area at the time of demonstration
29.8% reporting zero adoption by potential users in their area one year after the demonstration
10.9% expecting zero adoption by potential users in their area five years after the demonstration

The two results suggest a "half-life" for adoption of about five years. That number, however, is a composite of many technologies, target populations, and subjective judgements.

Exhibit 20b



Source. Minutes of Kindersley-Rosetown FarmLab Committee Meeting. November 10, 1981.

October 9, 1981

BRYSTA consultants

benefit is far from adequate justification for expecting real change in agricultural practices.

II.4 COMMUNICATIONS

Effective communication channels are essential to technology transfer. The communication is necessary both to diffuse information about the innovation or demonstration to potential adopters and to provide a coordinating mechanism among the groups participating in the program.

According to the program model of October 1981, there were to be multiple lines of communication (Exhibit 20 a and b). [See Appendix B for the original program description.]

Since the Ag Rep had the closest contact with the farmer, the Ag Rep was responsible for: publicizing and promoting the program in the district; developing proposals with co-operating farmers; identifying projects and co-operators if none were forthcoming; and conducting extension activities associated with projects.

The Regional Specialist was responsible for: publicizing and promoting the program; assisting with project evaluation and project design; and liaison activities with central specialists and the University. The Provincial specialists were responsible for publicizing and promoting the program and coordinating the regional staff and committees.

In this evaluation, the actual communication patterns have been compared to that model, as shown in Exhibits 21, 22 and 23.

II.4.1 Information on the Program

As planned, the Ag Rep was the most widely used channel of communication. About 56% of the respondents first heard of the program from their Ag Rep and 42.7% got the idea for their demonstration from the Ag Rep. Exhibit 21 shows the frequency with which individuals or groups were contacted for information to help set up the demonstration. While some groups, such as other farmers, university researchers, and regional and provincial specialists were not often contacted for

Exhibit 21

Contacts for Information Prior to Demonstration

	Times per Year					Contacts/yr + weighted avg.	
	never	1-4	5-8	9-12	>12	a)	b)
other farmers	68.2	26.8	3.2	0.6	1.3	3.5	1.1
ag district council	67.5	24.2	7.0	0.6	0.6	3.7	1.2
ag rep	5.1	49.0	33.1	6.4	6.4	5.3	5.0
university researchers	70.7	23.6	3.2	1.3	1.3	3.8	1.1
regional specialist	64.3	28.0	5.7	1.3	0.6	3.6	1.3
provincial specialist	75.2	17.8	3.8	2.5	0.6	4.2	1.0

+ Midpoints, plus 15 for ">12"; a) Users only b) all respondents

Source: Survey of Demonstrators, March, 1987. Question #35.

Exhibit 22

Most Valuable Information Source for Set-up of Demonstration

Information Source	% of Demonstrators
Other farmers	1.3
District council member	0.6
Ag Rep	66.9
University researcher	1.9
Regional specialist	8.9
Farm organization	0
Company rep	3.8
Provincial specialist	8.3
Elevator agent	0
Other	2.5

Source: Survey of Demonstrators, March, 1987. Question #36.

information, 94.9% of the demonstrators used the Ag Rep as an information source. The number of contacts usually ranged from 1 to 8 times during the year.

As shown in Exhibit 22, 66.9% of the demonstrators felt that the Ag Rep was the most valuable source of information for setting up the demonstration. In contrast only 1.3% felt that other farmers were the most valuable and 1.7% felt that university researchers were the most valuable. Regional specialists and provincial specialists were the most valuable sources of information for 8.9% and 8.3% of the demonstrators respectively.

II.4.2 Site Visits

Exhibit 23 shows the number of visits to the demonstration site, excluding tours. It is significant that 24.7% of the sites were not visited by other farmers since that was the target group for adoption. Many other groups, such as provincial specialists, university researchers and regional specialists, were not very active in visiting the demonstration site. The Ag Rep was active in visiting the sites, visiting from one to four times for 53.0% of the demonstrations and five to eight times for another 26.8%

A total of fifty-six demonstration sites, or 35.7% of the total sites reporting, were visited by tours. Of these sites, 57.4% were visited by one tour and 42.1% were visited by two tours during the duration of the demonstration (Exhibit 24). The number of people on these tours varied from three to 100. About half of the tours (49.7%) had eleven to twenty participants (Exhibit 25).

II.4.3 Contact since the Demonstration Ended

Exhibit 26 is a summary of the people who contacted the host farmer since the demonstration ended. Twenty percent of the demonstrators were never contacted about the demonstration after the fact. Conversely, 15.2% of the demonstrators were contacted more than twelve times by farmers. Contact by university researchers and Regional and Provincial

Exhibit 23

Visits of Demonstration Site

	Times per Year					Contracts/yr	
	never	1-4	5-8	9-12	>12	weighted avg.	
other farmers	24.7	41.3	12.0	8.0	14.0	6.4	5.1
ag district council	66.9	27.8	3.3	0.7	1.3	3.1	1.0
ag rep	10.6	53.0	26.5	5.3	4.6	4.8	4.3
university researchers	79.5	16.6	2.0	1.3	0.7	3.8	0.8
regional specialist	66.4	27.0	5.9	0.7	0	3.4	1.1
provincial specialist	79.6	17.1	3.3	0	0	3.1	0.6

Source: Survey of Demonstrators, March, 1987. Question #40.

Exhibit 24

Number of Tours Visiting the Site

Number of Tours	Frequency	% of Demonstrators Who Were Visited
1	31	57.4
2	13	24.1
3	5	9.3
5	1	1.9
6	3	5.6
20	1	1.9
	54*	100.0

* Three respondents were unsure of how many tours visited the demonstration site.

Source: Survey of Demonstrators, March, 1987. Question #38.

Exhibit 25

Average Number of People on Each Tour

Number of People	Frequency	% of Tours
≤ 10	9	17.3
11 - 20	24	46.2
21 - 30	6	11.5
31 - 50	10	19.2
> 51	3	5.8
	52*	100.0

* Five respondents were unsure of the number of people on the tours.

Source: Survey of Demonstrators, March, 1987. Question #3*.

Exhibit 26

Contact since the end of Demonstration

	Times per Year					Contacts/yr	
	never	1-4	5-8	9-12	>12	weighted avg.	
other farmers	20.0	41.4	16.8	6.9	15.2	6.4	5.1
ag district council	77.9	15.9	4.8	1.4	0	3.9	0.9
ag rep	22.8	60.7	11.0	2.8	2.8	3.8	2.9
university researchers	91.7	7.6	0.7	0	0	2.8	0.2
regional specialists	77.2	19.3	3.4	0	0	3.1	0.7
provincial specialists	82.1	16.6	0.7	0.7	0	3.0	0.5

Source: Survey of Demonstrators, March, 1987. Question #43.

Specialists was minimal. Ag Reps were quite active in contacting the demonstrator for information.

In 75.8% of the demonstrations, the farmer personally discussed the final results with an Ag Rep. The results were discussed with the Regional Spectalist in 18.5% of the demonstrations and 13.4% were discussed with a Provincial Specialist. The final results were discussed with university researchers in only 3.8% of the demonstrations. In none of the demonstrations did the respondents indicate that the final results were discussed personally with the mass media.

Since the demonstrations ended, there has been no follow-up at all in 52.9% of the demonstrations. Eleven percent are being followed-up by other individuals and 20.3% are being followed-up by the demonstrator.

II.4.4 Final Report

Sixty-five percent of the respondents received a copy of the final report and 10.2% received a copy of an interim report. Of those receiving the final report 85.8% felt that the report was an accurate description of the demonstration and 82.3% felt that the report would help others to make an intelligent decision about the innovation they tested.

II.4.5 Publicity

Although the final results were not personally discussed with the mass media, some demonstrations did receive coverage during the course of the demonstration. This coverage may not have been initiated by the host. The type of coverage received is shown in Exhibit 27.

Over 30% of the demonstrators felt that there were no other ways of promoting demonstrations and 56.1% felt that the message about the demonstration was transmitted well. On the other hand, almost 20% felt

Exhibit 27

Publicity for Demonstrations

Type of Coverage	% of Demonstrations
Television	8.3
Radio	11.5
Newspaper/magazine	33.1
Signs posted near site	54.1
Special mailings	14.0
Ag Rep's Newsletter	67.5
Other	15.9
Word-of-Mouth	20.4

Source: Survey of Demonstrators, March, 1987. Question #48.

that the message was transmitted poorly; 15.3% felt that the transmission was barely adequate and 4.5% felt that nothing was transmitted.

In those cases where media coverage occurred, one presumes it was a result of indirect contact through the Ag Reps or other secondary sources.

Two-thirds of the demonstrations were reported in the Ag Rep's newsletter yet only 7.0% of the demonstrators felt that the newsletter was a valuable source of new farming ideas.

II.4.6 Summary of Communication

The survey data indicate that the Ag Rep has an important role in the communication process. The Rep is the most active player in informing farmers about the demonstration program, helping farmers to set up the demonstration and contacting the farmer after the demonstration ended. Given the role of the Ag Rep in the program model, these results should be expected.

Since no one else has responsibility for the critical task of communicating OFD results, it has fallen to the Ag Reps. For them, it is an extraordinary task and one for which they do not oppease to being especially well-trained. The effectiveness of the Ag Rep in publicizing the demonstration remains open to some questions.

The data indicate that the link between demonstration and research activities is very weak. The majority of the research is carried out by the University of Saskatchewan yet communication between university researchers and the demonstrators is minimal. Intermediary linkages such as the regional and provincial specialists are also not utilized very often. The picture that emerges from the survey data is one of disjointed activity, with little feed-back from the on-farm demonstrations to the researchers. Without that link, there is a significant risk that research will be oriented toward idealized, controlled environments, rather than practical field situations. Adaptation from the research environment to working fields has been dependent upon

individual skills and initiative without any institutional framework or support - despite the expressed purpose of the program.

II.5 INFLUENCING THE INNOVATORS

Provided that OFD hosts are influential in the diffusion process, knowledge of their sources of information is important to any agency attempting to find them or accelerate innovation through them. Similarly, identifying the influences on innovators' own adoption decisions are critical first steps.

II.5.1 Information Sources on New Farming Practices

The sources which the demonstrators stated they would likely use for information about new farming practices are shown in Exhibit 28. The sources were also ranked in terms of being the most useful, the second most useful and the third most useful. Agriculture-related newspapers such as The Western Producer, Farm Light and Power, and Grain News were considered by many as being very useful as an information source. Although the Ag Rep's Newsletter was used by most of the demonstrators as an information source on new farming practices, the usefulness of the newsletter was considerably less than the agriculture newspapers. Other popular information sources included other farmers and agriculture-related seminars.

II.5.1.1 Visits to Other Farm Operations

Over eighty percent of the demonstrators had made recent trips to other farm operations for the purpose of gaining new technical information (Q. 56). Of the demonstrators who had made visits to other operations, 99.4% had made visits within Saskatchewan, 49.0% had made visits elsewhere on the Prairies, 37.6% had made visits to other parts of Canada and the U.S., and 25.5% had made trips outside Canada and the United States (Q. 57). Unlike the birth patterns discussed above, these data suggest a highly mobile group, with over 20% travelling out of North America to visit other farm operations. Exposure to new ideas and practices may be quite high as a result.

EXHIBIT 28

Information Sources for New Farming Ideas

Source	Use for New Farming Ideas (% Mentioning)		Relative Usefulness at Source (% of Respondents)			
	Yes	No	Most Useful	Second Most Useful	Third Most Useful	Total Ranking
Grain News	89.2	10.8	29.9	22.3	12.1	64.3
The Western Producer	91.1	8.9	22.3	16.6	7.0	45.9
Agricultural Seminars	84.7	15.3	10.2	6.4	5.7	22.3
Ag Rep's Newsletter	92.4	7.6	7.0	8.9	6.4	22.3
Farm Light & Power	91.1	8.9	2.5	6.4	13.4	22.3
Other Farmers	94.3	5.7	8.9	5.7	4.5	19.1
Radio	66.9	33.1	0.6	8.3	10.2	19.1
Weekly Newspaper	41.4	58.6	1.9	3.8	5.7	11.4
Television	69.4	30.6	1.9	2.5	6.4	10.8
Farm Organizations	60.5	39.5	1.3	1.3	0	2.5
The Star Phoenix	5.7	94.3	0	0.6	0	0.6
The Leader-Post	5.7	94.3	0	0	0	0.0
Other	21.7	78.3	12.7	15.3	14.6	42.6

Source: Survey of Demonstrators, March, 1987. Question #54 and 55.

II.5.1.2 Influences on Adoption

Each respondent was asked what he or she thought might influence others to adopt an innovation. The results are shown in Exhibit 29. **The economic results of the innovation as well as communication of the results and technical proof about the innovation were considered to be either very or quite important by over 90% of respondents.**

The demonstrators were also asked about the influence of different information sources on the last major change made on their own farm operations. The results are shown in Exhibit 30. The results of test runs were seen to be very important influences on the decision to adopt. Other important influences were the Ag Rep's opinion, neighbours' practices, product information, university staff, and the Provincial Specialist's opinion. The dominant influence of their own tests runs helps to confirm the respondents as innovators; heavy reliance on researchers and specialists reinforces the pattern.

II.6 IDENTIFYING INNOVATOR GROUPS

The literature on technology transfer suggests that there are several types of innovators. These innovator groups can be differentiated according to socio-economic characteristics. This section attempts to identify the different types of OFD innovators and the characteristics which are descriptive of each type.

II.6.1 Methodologies

A total of forty-three independent variables were selected for analysis on the basis of key concepts in the evaluation and program models, and their relevance in describing innovators. Of the 157 participants surveyed 124 had complete information on all 43 variables and could therefore be used in the analysis.

In order to carry out the analysis, procedures from a statistical package (SPSSx) were applied to the survey data. The inductive statistical techniques used in the analysis consisted of correlation, multiple factor analysis, cluster analysis and cross tabulations. The

EXHIBIT 29

Influences to Adopt

Influence	Level of Importance			
	Very	Quite	Little	Not at all
Economic results	73.9	21.7	3.2	0
Communication of results	72.0	26.1	0.6	0.6
Visibility of plot signs	51.0	31.8	10.8	3.2
Technical proof	44.9	45.5	9.6	0
Reputation of host farmers	39.6	47.1	11.5	1.3
Similarity of test site to other farmers' farms	36.1	47.1	14.8	1.9
Reputation of sponsors	33.1	45.2	14.6	6.4
Anything else	15.3	2.5	0	0

Source: Survey of Demonstrators, March, 1987. Question #58.

EXHIBIT 30

Influences on Last Major Change

Influence	Importance of the Influence			
	Very	Quite	Little	Not at all
Own test runs	74.2	23.9	0	1.9
University researcher	29.4	33.3	20.3	17.0
Provincial Specialist	26.0	41.6	20.1	12.3
Ag Rep's opinion	22.6	43.9	20.0	13.5
Neighbours' practices	19.5	42.9	20.8	16.9
Manufacturer's or agent's product information	14.2	40.0	34.8	11.0
Neighbours' opinion	11.0	36.8	29.0	23.2
Professional advisor	11.0	18.7	27.1	43.2
Other	7.6	6.4	0.6	0.6

Source: Survey of Demonstrators, March, 1987. Question #60.

objective with the analysis was to clearly define the innovator groups and the characteristics of the innovators.

The results from the analysis indicate, however, that innovator groups cannot be clearly defined. The findings provided by one analytical technique were not clearly supported by other techniques.

II.6.2 Bivariate Correlational Analysis

The inter-correlations of the 43 variables were measured first. Correlation is a measure of the degree of strength of the interrelationship between two variables. The purpose of the correlational analysis was to assess the relationships between key variables so that spurious relationships caused by third variables could be identified and excluded from further analysis. Several important findings were also derived at this level of analysis.

The correlational analysis is presented into two parts. The first part is demographic characteristics including age, education, farm size, ownership, farming experiences, and type of farm operation. The second part is the correlation between variables which are indicative of innovation in agriculture. These include the number of seminars, travel for information and computer application.

II.6.2.1 Demographic Characteristics

Age

As would be expected, the older participants were more likely to have a greater amount of farming experience. The older participants were more likely to involve offspring in day-to-day decision making and in major decisions about innovations. They were also more active with the Ag Rep. The Ag Rep was more likely to visit the demonstration site and be contacted for information if the participant was older. The older participant was also more likely to operate a sole proprietorship.

In many cases the older participants did not exhibit the traditional characteristics of an innovator. Education was negatively correlated

with age, indicating that the younger participants were better educated. The older participants were also less active in attending seminars on new innovations and in applying computers to their farm operations.

There was no significant relationship between age and the level of income or the type of farming done.

Education

The better educated participants did exhibit some of the traditional innovation characteristics. The better educated were younger, more active in attending seminars about innovations and more active in travelling in Saskatchewan and abroad for information. They were also more likely to use a computer in farm operations.

Better educated participants were also more likely to have a complex farm ownership structure. There was no significant correlation between education and income.

Farm Size

The results indicated that large farms were more likely to have a complex ownership and were more likely to have a higher net income in 1986 than smaller farms. The larger farms were more likely than small farms to participate in a demonstration for their own purposes.

Ownership

Respondents from farms which have complex ownership (i.e., corporate partnership) were more likely to use parents and offspring in decision making, indicating that many of the complex ownerships were family corporations. The sole proprietors, on the other hand, were more likely to involve spouses in decision making. The participating farms with complex ownership were larger, with higher net income, and their respondents were more likely to attend seminars.

Farm Experience

Since age and farm experience are strongly correlated, many of the variables which were interrelated with age are interrelated with farm experience. Those with a large amount of farming experience were less likely to have higher education, less likely to attend seminars and less likely to use computers. Ag Reps were more likely to visit the demonstration sites of the established farmers.

Type of Farming Operation

The analysis produced some interesting results based on the type of farming operation. Demonstrations on cereal crops were more likely to be visited by the Ag Rep. The mixed farms of cereal and livestock tended to use the Western Producer and Ag Rep's Newsletter as information sources more heavily and were less likely than other farms to use computers in their operations.

The participants with special crops seemed to be active as innovators. This group attended more seminars and did more travelling in Saskatchewan and abroad for information on new farming techniques than other participants. This group was also quite active in using computers in farming operations.

II.6.2.2 Indicators of Innovation

In the dataset there are several variables which are indicators of the classical model of innovators. These variables are: the number of seminars attended, the amount of travel to gain new technical information, and the use of other innovations, e.g., computers. Access to information is essential for innovation; therefore it is assumed that attending seminars and travelling to gain information may be indicators of innovative attitudes.

Number of Seminars

Participants who are active in attending seminars have the characteristics of being young, well educated, operating farms with complex ownership, being specialty crop producers, having higher

incomes, and being dedicated farmers. They also travel to get information on new farming techniques and use computers on the farm, confirming that the three primary indicators are indeed positively related.

Travel for Information

There is a positive relationship between education and travelling for information in Saskatchewan and abroad. Travel is also significantly related to: farm size, farm ownership, type of production and number of seminars attended. Those participants with higher education, larger farm size and complex ownership are more likely to travel to other operations to get technical information. Specialty crop producers and those frequently attending seminars on new innovations were also likely to travel for information.

Computer Application

A key measure of whether or not participants act as innovators is their adoption of other innovations. Computers are relatively new innovations to the farming business, therefore those participants who are using computers or considering computers may fall into the innovator category. The data indicate that the use of computers is related to the age, education and type of production. Those participants who are younger, better educated and cereal growers are more likely to use computers while participants who are mixed farmers are less likely to adopt them.

II.6.3 Factor Analysis and Cluster Analysis

Traditional models of technology transfer posit that innovators and early adopters have unique cluster of characteristics which can be used to identify them as adopters. By segmenting the innovators and early adopters, they can be targetted as the audience in front-loading the technology transfer process.

The factor analyses attempted to segment the 157 demonstrators who were surveyed into identifiable groups according to descriptive variables such as age, income, education and involvement with the Ag Reps. The

demonstrators were classified into five groups according to the relationship with the descriptive variables. It was determined, however, that the relationships between the groups and the descriptive variables were not strong (as measured by the correlation). This means that it is difficult to categorize the demonstrators into unique groups which could be used as target audiences. The cluster analysis supported this conclusion.

A detailed description of the factor analysis and cluster analysis is contained in Appendix F.

II.6.4 Conclusion

The results show that there are several variables which can be used to differentiate among the participants in the On-Farm Demonstration Program. The most important variables are:

- age and farming experience
- type of farm production
- size of farm land base
- ownership structure
- education level
- use of computer
- involvement of Ag Rep
- net farm income
- number of seminars on farming techniques attended
- frequency of travel to other farm operations for information
- motivation for hosting demonstrations
- degree of contact with other farmers.

Based on these variables the survey participants were grouped into five innovator types. The five types of participants were identified as:

1) Innovators who showed traditional characteristics of innovation or early majority adopters;
2) Community Leaders who were established in the farming community;
3) Young Innovators who were youthful, well educated and willing to try new farming community;
4) Large Farms with high income and a diverse product mix; and

5) Early Majority who were information seekers and willing to demonstrate farming technology once it was past the research stage.

However, the strongest conclusion which can be drawn from the results is that clearly defined groups, exhibiting clear and distinct characteristics, do not exist within this group.

The use of these indicators, therefore, is limited for policy and program management purposes.

II.7 CASE STUDY SYNOPSIS

The ten case studies documented as part of the evaluation provided a wider view of the OFD program than the survey of demonstrators because the opinions of other actors in the technology transfer process were solicited. This included the opinions of the Ag Reps, neighbours, community leaders, input suppliers as well as the host farmers.

The inferences from the case studies tended to support the traditional adoption models as well as the findings of the survey of demonstrators.

II.7.1 Adoption Factors

Interviews with neighbouring farmers who were potential adopters reinforced the importance of the adoption factors identified previously (Section I.5). The farmers specified the economics of an innovation as the most important factor in adoption. There was a general consensus that the innovation had to show a good rate of return over a variety of market conditions. The farmers were strongly influenced by market conditions and were concerned that changes in the market would adversely affect the profitability of an innovation. Other related factors included the amount of time the farmer had to study an innovation and the degree of interest in the innovation at the onset of the demonstration.

There was also general consensus that personal contact with the host farmer and the community esteem of the host farmer were important factors in the credibility of the demonstration to potential adopters.

These results indicate that considerable attention should be paid to the economic viability of an innovation and the quality of the host farmer as a demonstrator.

II.7.2 Communication

Communication and publicity were considered ad hoc by most participants. Communication channels were described by some of the interviewees as being through "coffee-row" and "kitchen table meetings". While this can be an effective communication channel, it is limited in application and range to a select number of people. The weaknesses of the communication is illustrated by the fact that many of the neighbouring farmers interviewed were not aware that a demonstration was occuring in the area. Many of the host farmers, Ag Reps and community leaders interviewed felt that demonstrations were well publicized through personal contact and notices in public buildings but the apathy among the general farming population was high. It was felt that although the demonstrations were accessable the encouragement to visit or tour the site was low. Comparisons were drawn with the better attended, private-industry sponsored demonstrations which were better organized and offered incentives such as meals and free samples.

A common complaint among neighbouring farmers was that they often could not attend site tours because of time constraints. This indicates that the timing of the organized site tours is important and that considerable lead time is necessary for the target group to make time available to attend.

II.7.3 Process of Demonstration

Several of the demonstrations used as case studies could be classified as either demonstrations of a well tested innovation or of an untested innovation. The well tested innovations are strongly supported by

research and are demonstrated primarily for expose to adopters. The untested innovations are not supported by extensive research and are demonstrated primarily to determine whether they are feasible. Therefore, the research component of these demonstrations is high.

Both types have a role in a demonstration program; however, both have different requirements in terms of design, communication, linkage to research and promotion of results in order to be effective. The OFD program did not make the distinction between the two types.

Some of the multi-year demonstrations had different results depending on the conditions prevailing from year to year. This is a strong indicator that multi-year as opposed to single-year demonstrations are required for some innovations in order for the results to be credible.

11.7.4 Involvement with Private Industry

The results of the case studies indicated that private industry such as input suppliers, equipment manufacturers and seed growers had a low level of interest in the On-Farm Demonstrations. This is partially a result of the lack of awareness of the demonstrations. Often, private industry is not solicited by the participants for involvement and the results of the demonstration are not communicated. In several uses individuals representing private industry interest stated that they would be interested in the results of the demonstrations for their business interests. Others felt that the demonstrations lacked scientific merit or that the role of the private industry would be too minor to become involved.

11.7.5 Conclusion

The adoption factors which are present in traditional technology transfer models are also present in the model for Saskatchewan agriculture, with heavy emphasis being placed on the economic viability of the innovation. There is a strong indication that some of the demonstrations should be conducted for several years so that the long term economic viability of the innovation can be evaluated. The multiple year demonstrations are necessary for innovations which have a high degree of

risk in incorporating for the farmer. One of the largest hurdles in the effectiveness of the UFD program is the degree and type of communication needed in order for technology transfer to occur. It seems that more than informal communication channels are necessary to encourage farmers to study and/or adopt an innovation.

III PROGRAM OPERATIONS AND IMPACTS

The objectives of the old On-Farm Demonstration Program were broadly defined as: displaying for the farming community results obtained in research and/or development which would benefit agriculture in Saskatchewan. These objectives are not specific enough for an objectives based evaluation. An evaluable statement of objectives should contain a specification of the planned activities, and a statement of the output desired within a specified period of time using a defined set of human and capital resources. Clearly-stated objectives are valuable tools in policymaking.

The program operations and impacts of the demonstration program cannot be evaluated in terms of achieving the broadly-stated goals. However, several other criteria can be used in assessing the impact and operation of the program. These criteria include conformance, to existing models of technology transfer and successful demonstration programs. Using the results of the survey of demonstrators, document and file reviews, and interviews FarmLab's achievements can be assessed against those standards. This chapter analyzes several important components of the OFD Program, including:

- administration;
- budget;
- links to other components;
- communication network;
- selection of technologies;
- selection of cooperators;
- promotion; and
- uptake of demonstrated technologies by other procedures.

III.1 PROGRAM DESIGN

The OFD Program provided a rather haphazard system of technology transfer. Several pieces of the transfer chain were either missing or supplied by less organized means than specified in a program model. The program did not correspond closely to existing models of technology transfer or to successful demonstration programs.

There was no direct link between the research and demonstration components. Follow-up of the adoption process beyond the demonstration level was not designed to be part of the complete transfer process. Various issues associated with adoption were not linked to the demonstrations either in design or implementation. Each of these gaps represents a slippage in the degree to which the program design made use of existing knowledge about effective technology transfer.

III.2 PERCEPTIONS OF THE DEMONSTRATION PARTICIPANTS

The overall perception of the On-Farm Demonstration Program, based on the opinion of demonstrators surveyed, was that the program was worthwhile. **Over 93% of the participants felt that they personally benefitted from holding the demonstration (Q.17.5) and over 96% felt that the demonstration was well worth the time and money put into it (Q.17.6).** Despite the fact that all respondents had agreed voluntarily to participate in the program, these numbers represent a ringing endorsement.

One of the measures of performance of the demonstration program is whether or not other farmers in the area benefitted from the demonstration. The opinions of survey participants were less clear on this issue. Over 68% felt that the area farmers benefitted while 14.7% felt that there was little or no benefit and 10.8% were neutral (Q.17.4). (Subjective estimates of this sort, from an enthusiastic group of participants, should not be interpreted as accurate measures of actual benefits.)

Most of the participants felt that the administration of the program was adequate. Almost all (97.7%) felt that the application to participate was handled efficiently and 84.7% felt that the technical assistance was adequate (Q.21). Over ninety percent felt that the compensation was adequate (Q.20).

A further support for the conclusion that the participants felt that the demonstration program was worthwhile was that 93.0% stated they would consider hosting another demonstration (Q.82).

III.3 PROGRAM ADMINISTRATION

Much of the program's administrative burden was carried at the lower level of the extension infrastructure, specifically at the Ag Rep level. Other components of the infrastructure such as the Provincial and Regional Specialists, were generally not involved in administration. The "grassroots" type of administration has several advantages, particularly because of the Ag Reps' close association with the farming community. Unfortunately, Ag Reps may not have the expertise and time to adequately review, supervise and evaluate demonstrations. The administrative structure which required numerous meetings to set priorities for demonstrations and to approve or reject proposals for demonstrations led to high administrative costs.

The official program model, (Exhibit 20 above) with proposals being farmer-originated, has administrative disadvantages. One disadvantage is the lack of coordination across the province. The farmer-proponent model is unlikely to be a very effective means of supporting research directions or policy initiatives. It was also dificult to coordinate broadly applicable innovations requiring multi-site demonstrations. Those projects normally require central sponsorship and placement. Lack of direct coordination between research and the demonstration program may diminish the value of the investment in research if it is not demonstrated in a coordinated manner.

One advantage of the farmer-proponent model is that it allows farmers to stimulate developments which may originate outside the provincial research system. Primarily, however, it builds on the likelihood that a farmer-proponent will propose something useful in his operation - and use it if the test is successful.

An alternative administrative system for technology transfer was tried by the New Brunswick CREDA (energy) program. In that program, large-scale demonstrations were separated from small projects. The former tended to be much more expensive than the latter and to involve more centralized organizations. The latter involved more projects, a wider variety of citizen-level sponsorship, and more local expenditure authority.

Other CREDA demonstration programs separated technical from economic and market demonstrations. Each type had different scientific and communication designs and personnel requirements. Several of these issues do not appear to have been addressed in the OFU program design.

When project data were aggregated to the program level, the data retained were: the number of projects; percentage of projects by agricultural sector; and allocations and expenditures. Tabulations were produced manually from original sources. Consequently, information needed for evaluation was not accessible and reformulation of the information would require a complete recompilation of file data. As a result, program-level reporting was considerably more limited than would be possible with computerized databases and analytical packages.

Additional information would be required to evaluate the technology transfer system. Before a demonstration proceeds, the type of markets and number of potential adopters should be identified and a diffusion plan should be formulated. It should be noted that under both the old OFU and new ADF Demonstration Programs it was suggested that the farmer-proponent include a communication plan in the application to the program. However, a communication plan was not required and the farmer-proponent would probably not have the expertise to adequately produce such a plan. In any event, much more than simply pouring out communications is required for effective diffusion, a lesson learned with some chagrin in several of the CREDA programs.

III.4 BUDGET

The entire FarmLab program had a budget allocation of $25 million over the life of the five year program with the bulk of the budget being allocated to research. Approximately five percent of the budget was allocated to technology transfer through the OFU component.

The five percent allocation for demonstration does not compare favourably with other successful agricultural technology transfer programs. The Farming for the Future Program in Alberta spends approximately 33 percent of allocated budget for its on-farm demonstration program, for example.

Studies indicate that the rate of return from agricultural research is high. The internal rate of return from wheat research in western Canada was estimated to be in excess of 30 percent; rapeseed breeding research in western Canada over 100 percent; and all agricultural research in Ontario at over 65 percent.[17] Other studies indicate that the social rates of return from agricultural research appear to exceed the internal rates of return.[18]

These figures indicate that the benefits from the investment in agricultural research in Saskatchewan are potentially high. The benefits in FarmLab were probably severely diminished because of the program's low ratio of demonstration to research spending.

III.6 LINKAGES TO OTHER COMPONENTS

One of the objectives of the On-Farm Demonstration Program was to link the research component of FarmLab which was carried out through the University of Saskatchewan and Agriculture Canada to the farming community. The On-Farm Demonstration Program was specified as the link. This research-extension linkage is common in agricultural technology transfer programs. Unfortunately, the research-demonstration linkages under the FarmLab program were weak.

Researchers had little input to the design of the demonstrations and little feedback of the results. Many designs may not have been useful for research purposes due to lack of scientific and statistical controls but the very lack of scientific laboratory controls makes the on-farm demonstrations highly effective field laboratories. The results achieved by real farmers on diverse lands must be the ultimate test of any new technology. If a crop strain or animal procedure is not sufficiently robust for actual field usage, it will not diffuse, no matter what is laboratory promised.

The evaluation research showed that only one survey participant received the idea for a demonstration directly from a university researcher and only two frequently contacted university researchers for information to set up the demonstration. The pattern of minimal involvement on the part of university researchers is consistent throughout the sur-

vey. Visits to demunstration sites by university researchers were infrequent as was contact for results after the demonstration had ended. In addition, only 3.8% of the participants had discussed the final results of the project with a university researcher.

III.G COMMUNICATION NETWORKS

The research on technology transfer identifies communication networks as a critical component of the diffusion and adoption process. Communication disseminates information about the innovation and provides reinforcement to those who are considering adopting.

The opinion of peers and people with experience with the innovation is a component of the adoption decision. Therefore, it is important that the demonstrating farmer communicate the results of the demonstration to other farmers. **Farmer-to-farmer communication was not as strong as its importance to the program merited.** One of the strongest indicators of this finding is that only 40.8% of the survey participants stated that they had personally discussed the final results of the project with any other farmers (Q.47).

Farmers were not active in promoting the demonstration program. Only 4.5% of the participants first heard of the program from other farmers (Q. 15) and 5.7% first got the idea for a demonstration project from other farmers (Q. 14). Only 31.9% percent of the demonstrators contacted any other farmers for information on setting up the demonstration (Q. 35) and a mere 1.3% felt that farmers were their most valuable contact (Q. 36). About twenty-five percent of the sites were apparently not visited by other farmers and 41.3% were visited only one to four times by other farmers (Q. 40). The average number of farmer visits per site was 5.1. Only 35.7% of the sites were visited by tours. **Given the large number of farmers within contact distance these numbers are disturbingly low.**

Twenty percent of the participants had not been contacted at all for information about the demonstration since it ended and 41.4% had been contacted only one to four times.

Forms of mass media such as printed and broadcast media were not widely used to communicate OFD results. In no cases did participants report discussing the final results of the demonstration with the media.

The conclusion that can be drawn from these results is that both the informal and formal communication networks were ineffective.

The old OFD program tended to rely heavily on Ag Reps and project reports, with some emphasis on signs, tours, field days, and word-of-mouth communications. In some cases, these methods appear to have been standardized across the whole program. In others, they were largely dependent on the time, commitment, and ingenuity of the Ag Rep in the project district.

There are several factors which influence the communication network for different innovations. Demonstrations have different audiences. Regions have different credibility patterns. Different innovations are at different stages of development and diffusion. The results of the survey indicated that the source of information on innovations and new farming techniques was largely a matter of personal preference among the participants. Consequently, communications plans should be differentiated according to the audience and type of innovation.

Communication outputs from the demonstration were often designed for potential adopters - but it is less clear that the demonstrations themselves were designed to provide convincing information for identifiable groups of adopters. Follow-up and redesign were outside the definition of the demonstrations and were therefore unorganized and usually ignored. Some important exceptions stand out clearly. They include projects designed, sponsored and monitored by industry associations and commodity groups.

III.7 SELECTION OF TECHNOLOGIES

According to the program model a farmer may develop a project idea and, with the cooperation of the Ag Rep, develop it into a demonstration project. The farmer then carries out the demonstration with only abnormal operating costs being reimbursed. This decentralized system

created several factors which affect the selection of technologies. The decentralization makes it difficult to pursue policies which have provincial objectives. The objectives of the On-Farm Demonstration program are set through the Saskatchewan Department of Agriculture and the principle of equity dictates that the program should attempt to benefit all rural agricultural regions of the province equally. The program was to concentrate on five areas of agriculture: crops, livestock, soil conservation, irrigation and human resource development. Because of the decentralized nature of the program it was difficult to meet those objectives. Consequently the dispersal of the demonstrations was erratic within agricultural districts and regions and there was a concentration of demonstrations dealing with soils and crops.

The selection procedure also made it difficult to link the demonstration and research components of FarmLab. Because the idea for a demonstration was ordinarily the responsibility of the farmer, project selection was limited by the amount of information the farmer had available and the amount of effort he or she was willing to expend. A farmer cannot be cognizant of all agricultural research; therefore the process of selection tends to favour projects which are consistent with the farmer's existing information and understanding of the research. Since the farmer is not reimbursed for labour, there is also a bias towards projects which are less complex and require less labour.

An alternative to the decentralized selection of technologies is the centralized process which is used by the Agricultural Research Service (ARS) of the United States Department of Agriculture. In that system the agricultural experiment stations in each of the fifty states develop farm innovations and then turn them over to their state agricultural extension services to diffuse; each innovation that is judged ready for diffusion is recommended to farmers for their adoption by agricultural experts. The innovation may be given a blanket approval, or it may just be recommended for certain farmers with specific climatic or soil conditions, or for other special conditions.

The selection of technologies for demonstration under the old OFU program must also be criticized because it did not involve researchers and private industry. Findings from a technology transfer program in

British Columbia suggest that transfer is improved if development research and technology transfer are planned as a unit. The B.C. program of integrated pest management in greenhouses illustrates the advantages of planning technology transfer programs while in the process of development research.[19] In this case, the planned development of supporting private enterprise and the involvement of private enterprise in the program was of considerable benefit in advancing use of the technology.

III.8 SELECTION OF COOPERATORS

The results of the analysis to identify innovator types (Chapter II) indicated that distinct types of innovators were not clearly present in the program. This result was partially a result of the selection of cooperators for the program.

Different characteristics of farmers enhance or diminish their value as links in the technology transfer process. These characteristics include social position with other farmers, motivation for hosting demonstrations, and communication ability of the farmer. At the approval stage of the demonstration, consideration was rarely given to the innovation characteristics of the applicant.

The demonstrations under the program were small and relatively simple, most with a budget of less than $500. There was relatively easy access into the program as long as the project was approved by the Agriculture District Extension Board. As a consequence a cross section of the farming population was attracted to the program. This is reflected by the lack of clearly defined groups illustrated in the analysis of the participants.

There is evidence from the survey of demonstrators that some of the demonstrators were not active in the technology transfer process. Participants who became involved solely to test the idea to see if it would work on their own farm may not have been very active in communicating the results to potential adopters. A few participants did not even know whether or not their demonstration sites had been visited by other farmers or by tours.

The small size of the demonstrations and lack of financial support outside of operating costs could have been a deterrent to some potential innovators. Large scale and complex demonstrations were not encouraged by the program, thereby limiting the type of cooperator to those willing to undertake small projects.

III.9 PROMOTION OF RESULTS

The promotion of results was relatively poor and low-impact. Promotion techniques relied heavily on personal contact from farmer to farmer and Ag Rep to farmer. Promotion by peers is cited in technology transfer models as an important reinforcement in the adoption process. If this method is to be used effectively, however, more consideration must be given to the demonstrators' position in the farming community.

Where participants became demonstrators in order to test an innovation on their farm, there was some potential for many local farmers to view the demonstration as "someone else's project" with few consequences for them. This loss is magnified by the fact that area farmers were often not made aware of, and not involved in, local demonstration projects.

The Ag Rep was a possible channel for the promotion of the results of demonstration projects. The effectiveness of the Ag Rep is limited by the information the Ag Rep has on the demonstration, his or her ability to convey the results, and the credibility of the Ag Rep to the farmers.

The effectiveness of promoting the results was severely hampered by the small size of the project budgets and the large number of demonstrations. It would be costly to collect all relevant information on each project and very cost-ineffective when many of the results are not worth promoting extensively.

III.10 UPTAKE

The research on agricultural technology transfer stresses advance identification of potential users of an innovation. This group is

described as a target audience. By identifying the potential users of an innovation, the demonstration process can then be designed specifically to overcome the adoption barriers of its target audience.

The program model and program files give clear indications that target audiences were not identified. When a demonstration was initiated, there was no formal method of evaluating which groups would benefit from the innovation and how the demonstration would encourage their uptake.

Because the target audience was not defined, it is more difficult to measure how many of the potential adopters have actually adopted the innovation. This measure requires monitoring over a period of time. The lack of a target market also makes it more difficult to promote the results of a project. Since it is not cost-effective to provide information to all farm operators for all demonstrations, the results should be conveyed only to those who are potential adopters. "Information overload" might cause even useful information to be treated as junk mail if too much untargetted material is dispersed.

Estimates from the survey of demonstrators indicate that uptake has generally been low and will grow slowly. A total of 87.2% of respondents felt that some, most or all of the farmers in the district could benefit from the innovation (Q.26). However, only 30.9% said that some, most or all of the farmers were using the innovation one year after the demonstration (Q.28) and only 63% felt that farmers would accept the innovation five years after the demonstration (Q.29).

It was not possible to assess incrementality without a longitudinal or geographic control group, so it was impossible to determine the extent to which the program accelerated diffusion. Expert interviews and demonstrators' comments, however, indicated strong support for the program. Almost all interviewees indicated a belief in the basic program design and in its improved effectiveness over time.

IV. OPTIONS AND ALTERNATIVES

The terms of reference for this assignment identified a number of issues which the Agriculture Development Fund wished to have addressed. In the course of the evaluation, numerous additional issues appeared. While many of these issues have been addressed in the preceeding chapters, some specific matters of program design and operation remain.

IV.1 PROGRAM RATIONALE

There is a role for government in the process of transferring research results to on field testing and technology diffusion. Research institutions, such as the universities, are primarily concerned with the development of scientific knowledge and new technologies under idealistic laboratory conditions. Adaptation for usage in practical farm operations, and redevelopment of technologies on the basis of those field trials, is a critical area which is not easily supported by non-government organizations. In addition, government may wish to accelerate the progress of diffusion at any stage of the market cycle.

IV.1.1 Scope of Technology Transfer Effort

Comparable programs in the United States and other provinces of Canada show that the expenditures on technology transfer are normally in the range of 25 - 50% of the R & D budget. In order to make full use of the expenditures on research, a strong and sophisticated approach to technology transfer and diffusion is necessary. In this sense, the technology transfer efforts of the FarmLab program were badly underfunded. The consequences of that situation were: lack of administrative direction and support; incomplete development of demonstrations; inappropriate demonstrations; exclusive dependence upon small scale demonstrations; and lack of extensive diffusion results.

Both the evaluation findings and the evidence from similar programs in other jurisdictions suggest that:

- technology transfer expenditures should be brought into a more even balance with research expenditures;

- demonstrations should be planned and developed in a more comprehensive manner, with specific focus on the diffusion barriers which are foreseen and intended to be overcome by the demonstration;

- specialized administrative support should be provided to the demonstration process.

IV.2 TYPES OF DEMONSTRATIONS

IV.2.1 Purpose of Demonstrations

On-farm demonstrations play a number of roles in the process of diffusing innovations in Saskatchewan's agricultural sector. In general, the universities and research agencies take responsibility for the development of new technologies and their initial field trials. These field trials, however, normally occur under carefully controlled, near-laboratory conditions. They are conducted within a research environment, usually by trained research technologists. Research tests also usually take place over a restricted geographic areas. As a result of these factors, the research agencies do not produce demonstration results which fully test the applicability of new innovations in actual working conditions.

From the point of the researchers field trials onward into the development and diffusion process, there are many critical steps to be covered. Commercial organizations will undertake some of the steps for certain products at particular times. Some forms of agricultural production are matched by producers' associations which are also capable of organizing some development work for some products some of the time. If, however, the Government of Saskatchewan wishes to mount a comprehensive assault on the rate of innovation and diffusion within the sector, more comprehensive and sophisticated organization is required.

Among the attributes which need to be examined in the development and diffusion process are the following:

- breadth of applicability across producers in various parts of the province;

- technical performance of an innovation under actual field conditions with regular producers operating the trial;

- ergonomic factors, such as accessibility of required equipment, ease of maintaining required controls, sensitivity of harvesting choices;

- economic benefits relative to costs;

- target markets for adoption of new technologies, in the sequence which they are expected to adopt;

- adoption barriers for each major market segment.

In order to accelerate agricultural innovations in this province, each of these major steps must be addressed. It follows, therefore, that demonstrations addressing one or more of these steps are appropriate. Comprehensive assault requires addressing all of them.

As a result, demonstrations should be designed around a specific purpose furthering the testing and/or diffusion of innovation. Both technical and market oriented demonstrations and related research are required. Comprehensive efforts to advance a particular technology should include all of the above steps.

The primary implication of these findings is that **demonstrations should be better planned, more purposeful, and larger undertakings than was the case with the previous program.**

IV.2.2 Small Scale, Farmer Initiated Demonstrations

While the OFD component of the program was ill suited as a vehicle for major diffusion of agricultural innovations, it was well suited for another useful purpose. Stimulation of an innovative attitude at the producer level is often well served by a program of small, low cost demonstrations. These demonstrations allow producers to test out new ideas, to import new technologies for testing on their own farms, and help identify the innovative leadership within their communities. In

EXHIBIT 31

Program Model for
Large Demonstration Projects

PROJECT INITIATORS

- possible initiators include farmers, user associations, Specialists, ADF Staff and corporations

AGRICULTURAL REPRESENTATIVES

- act as information brokers to farmers

REGIONAL AND PROVINCIAL SPECIALISTS - - - - -

- project design and site management
- communications effort
- evaluation and dissemination of results

TECHNICAL SUPPORT

- support Specialist with technical assistance and communication

REVIEW COMMITTEE

- approve or reject proposals
- recommend exenditures to the ADF

addition, the small scale demonstrations component of both renewable energy and agricultural demonstration programs has often proven a fertile source of new ideas.

Many small scale demonstrations are, however, only useful in disproving local folklore or misguided assumptions. While that has a useful role, it can be accomplished effectively with minimal expenditures and lower levels of administrative support.

Low cost, small scale demonstrations may also be useful at the early adopterstage of the diffusion cycle, allowing a wide number of potential adopters to participate in local field trials at relatively low unit cost to the sponsor. Such demonstrations should not be confused with more comprehensive assaults on diffusion barriers. Separation of small scale demonstrations and their more comprehensive cousins into subprograms has proven a useful technique in other sectors and jurisdictions. Models for subprograms which treat large and small projects separately are shown in Exhibits 31 and 32.

IV.3 DESIGN OF DEMONSTRATIONS

Even for cost-effective innovations, success is dependent upon a receptive market. If producers want the benefits of an innovation, it is much more likely to be adopted than if they are nonchalant. It holds, therefore, that demonstrations are most likley to be effective in increasing uptake of an innovation if those demonstrations are sited near producers who have indicated an interest in receiving the benefits available. That conclusion leads to the corollary that similar demonstrations may be sited in different parts of the province from one year to the next as producer groups in the various districts become interested in the technology.

Contacting producers who are at the adopting stage of their decision making requires that information be presented in various locations. Efficient contact occurs at specialized seminars while less efficient contact occurs at general agricultural meetings such as trade shows. The least effective method of contacting the producers at the decision making stage appears to be through the mass media. Even there, how-

EXHIBIT 32

Program Model for a
Small-Projects Fund

FARM OPERATOR

- initiates on-farm demonstrations
- sets-up and operates demonstration sites
- completes ADF "Demonstration Application" form

AGRICULTURAL REPRESENTATIVES - - - - - - - - - - - SPECIALIST

- co-operate with farmer to develop demonstration
- review and approve project proposal
- provide an annual summary of all demonstration projects
- approve payments*

- review demonstration for design and technical merit

AGRICULTURAL EXTENSION DISTRICT BOARD

- establish district priorities

* for non-labour inputs over and above those used in normal farming practice, to a maximum of $500 per project per year.

ever, the large numbers of producers may result in useful development of general awareness and a small percentage of key contacts. Repetition of demonstrations, or of presentation of critical information for the adoption decisions and their support, should be anticipated. **As an innovation moves through its natural development cycle, new producers with different characteristics will become interested. Appealing to them will require some redefinition of the information packages and the types of support available as the product cycle matures.**

IV.3.1 Fixed vs. Moving Sites

There has been some controversy on the relative merits of fixed vs. moving sites. Each may well have a useful role. Fixed sites may be most appropriate when the user community is clustered nearby, perhaps like the South Saskatchewan irrigation area. Moving sites, conversely, are needed to take innovations to a dispersed clientele. Depending on the support provided to a site (in terms of publicity, tour sponsorship, collocation with major events like Agribition, etc.) the catchment area for a fixed site will vary. **Trade offs between fixed and moving sites will depend on the target audience to be reached and an assessment of the cost-effectiveness of the communication options.**

IV.4 PARTICIPANT SELECTION

The official FarmLab program model indicated that the demonstrations were to have been farmer-initiated. Some were, but many were not. In our opinion, even more should not have been if maximizing technology transfer was the primary objective. The program was effective in allowing grassroots innovators to take a stab at a new technique or to participate in the R&D system. **It was not effective in diffusing new technologies on a widespread basis. Better diffusion results will require stronger central organization and direction.**

Technologies which are identified by Saskatchewan Agriculture as ready for first, second or third stage diffusion, should have attached to them a diffusion plan. In most cases, that diffusion plan will require centralized effort. In those cases where multiple on-farm demonstrations are required with the work being conducted by local farmers, then a search should be made for opinion leaders at the community level who

are prepared to undertake the work on a contract basis. **Supervision and management should be strong enough to ensure that the technical results are correct and that adequate market data are collected for the purposes of the demonstration effort.** It is highly unlikely that comparable results can be achieved by relying on wide-spread farmer initiation.

IV.5 SECTORAL PRIORITIES

The OFD program began with a strong concentration on demonstrations in the crops and soils sector. Over time, emphasis on the livestock industries was seen to increase. The issue of sectoral and geographic dispersion of demonstrations and demonstration funds it is largely one of political fairness. The primary economic objectives of a diffusion enhancement program imply a search for the most cost-effective expenditure of development funds relative to the economic benefits likely to be derived from the resulting diffusion. Genuine economic opportunities are rarely distributed on the same basis as voters.

From the point of view of an investment of public resources in the development of the province's dominant economic sector, it would appear that the bulk of funds invested in demonstrations should be concentrated on those technologies and sectors where the greatest economic benefit is to be had. It is highly likely, therefore, that economically rational distribution of funds will be seen as unequal but cost effective.

One effective means of addressing this issue is the separation of small and large projects. **The distribution of small project funds on a geographic basis is more readily accepted and allows for the distribution of opportunity on a geographic basis at reasonable economic cost.** A small projects fund also provides two important release valves. One of those is the opportunity for producers with radically different ideas to undertake research of their own design, even if it does not meet the approval of the established arbitrars of technological development. At relatively low cost, the opening is left for the unusual innovation which does turn out to be important despite its unorthodox origins. The second valve is for those projects which do not meet the existing requirements for major development funding but

for which there remains a loyal following. Those followers may then be able to proceed on the basis of small project funds until they can establish sufficient support to reapply for major development funds.

IV.6 SUMMARY

The old OFD program provided a reasonable working model for a small project demonstration program. It was quite inadequate as a vehicle for diffusion of technology in the province's leading sector. Dramatically increased resources and much more sophisticated project design and management are called for. Feedback loops between research, development, demonstration, and diffusion need to be closed and accelerated. Greater attention to economic criteria and market introduction barriers is needed.

FOOTNOTES

1 Saskatchewan Department of Agriculture, Regional Extensions Services Branch, Policy for Locally Initiated FarmLab Projects; April 1, 1984 to March 31, 1985.

2 Brystra Consultants, Evaluation Assessment Report: FarmLab Demonstration Program, prepared for Saskatchewan Agriculture (November 1986).

3 Philip Kotler and Gordon H.G. McDougall, Principles of Marketing, Prentice-Hall Canada Inc. (1984) p. 304.

4 Sid L. Huff, "Computing as Innovation" Business Quarterly (June 1987) Vol. 52 No. 1; p. 709.

5 Richard Nelson, Merton J. Peck and Edward D. Kalachek, Technology, Economic Growth and Public Policy; the Brookings Institution. Washington D.C., (1967) p. 99.

6 Nelson, Peck and Kalachek. p. 102.

7 See R.R. Nelson and E.S. Phelps, "Investment in Humans, Technology Diffusion, and Economic Growth", American Economic Review, Vol. 56 (May 1966).

8 Bryce Ryan and Neal C. Gross, "The Diffusion of Hybrid Seed Corn in Two Iowa Communities", Rural Sociology (March 1943).

9 Nelson, Peck and Kalachek. p. 103.

10 Tornatzky, et al. in A.J. Webster, Agriculture Technology Transfer: A Case Study prepared for the Research and Regional Development Branches, Agriculture Canada, August 1986, p. 30 summarizes these studies.

11 Congress of the United States, Office of Technology Assessment, Encouraging High - Technology Development, Background Paper #2 Washington pp. 2-8.

12 Richard Nelson, Merton Peck and Edward Kalacker, Technology Economic Growth and Public Policy, The Brooklings Institution (1967) p. 90.

13 A.J. Webster, p. 28.

14 A. J. Webster, p. 29.

15 J. McKenzie and H. Zilm, Final Report of Working Group on Research and Technology Transfer, First Ministers' Conference, November 1985. p. 6.

16 A.J. Webster, p. 7.

17 R.P. Zentner, "Returns to Public Investment in Canada Wheat and Rapeseed Research", in Economics of Agricultural Research in Canada, K.K. Klein and W.H. Futron (editors). 1985.

18 D.L. Heuth and A. Schmitz, "Rates of Return to Research from Joint Investment: Public and Private" in Economics in Agricultural Research in Canada, K.K. Klein and W.H. Futron (editors) 1985.

19 A.J. Webster, p.74.

APPENDICES

APPENDIX A

Terms of Reference

APPENDIX "A"

1. Project Title

On-Farm Demonstration Evaluation

2. Project Objectives

The objective is to fully evaluate the methodology, effectiveness and results of the On-Farm Demonstration Projects which were carried out under the direction of the Department between April 1, 1981 and March 31, 1986.

This evaluation and assessment of the On-Farm Demonstration program will include in the final written report at least the following:

(a) the perceived value, strengths and weaknesses of the program as seen by:

i) cooperators,
ii) staff of Agriculture,
iii) University personnel, and
iv) Other interested groups and/or institutions as deemed appropriate by the contractor in the conduct of this review;

(b) comparison of fixed versus moving demonstration plots, e.g. "Innovative acres" versus On-Farm versus multiple projects at one fixed site versus multiple projects that move;

(c) promotion of results:

i) On-Farm program,
ii) Individual projects;

(d) uptake of information by target audience;

(e) suggestions for measuring uptake;

(f) suggestions for cooperation with private industry in developing Demonstrations;

(g) recommendations on improving Demonstration projects;

(h) recommendations for future Demonstration project format building on the perceived strengths of the On-Farm program;

(i) in what areas does the technology transfer model used in On-Farm Demonstration require modification for effective delivery:

i) Can the efficiency of the technology transfer system by improved?

ii) What format of demonstrations is most likely to maximize effectiveness?
iii) What can be done to increase the quality of data (e.g., project reports) stemming from the demonstrations?
iv) How can limited management resources best be used to operate the demonstration program?
v) What systematic guidelines should be developed for the siting and delivery of demonstrations?
vi) How would alternative delivery agents affect the efficiency of technology transfer?
vii) How many demonstrations are needed to transfer agricultural research in different specialties?
viii) What is the communication system by which research results are disseminated? How effectively does the present demonstration format tap that communication and adoption system?

(j) review On-Farm Demonstration objectives and make suggestions, if necessary, for changes to the Agriculture Development Fund;

(k) review On-Farm Demonstration administrative procedures and make suggestions, if any, for changes to the Agriculture Development Fund

3. Background and Rationale

The On-Farm Demonstration project was a five-year project conducted by the University of Saskatchewan and Saskatchewan Agriculture and financed by Saskatchewan Agriculture. The two major components of the project were University research and field demonstrations to transfer research results to the farm community. Demonstrations were carried out on selected farm sites with farmer cooperators working with a researcher and/or technician in demonstrating various projects of interest to farmers and agricultural specialists. The present evaluation is concerned with these field demonstrations.

Because the funding allocated to this five-year program was substantial (nearly $500,000), it is felt an evaluation of the entire program should be undertaken. This evaluation will focus on some the approximately 900 demonstrations carried out over the five years.

4. Benefits

An evaluation of the On-Farm Demonstration Program will suggest methods of improving future programs of a similar nature and make recommendations concerning problem areas and how to overcome these problems.

It will ensure better technology transfer in any similar undertaken in the future, i.e., the Demonstration component of the Agriculture Development Fund.

5. Operational Plan

5.1 Contact

Dr. Thomas A. Bryant
President
Brystra Consultants
2550-15th Avenue
Regina, Saskatchewan
S4P 1A5
Telephone (306) 352-1561

5.2 Action Plan

(a) enlarge on the literature review done in Phase I to include agricultural technology transfer projects such as "Alberta's Farming for the Future" and projects in the United States. Review should look at alternatives to technology transfer than demonstrations;

(b) conduct interviews with Departmental officials, University researchers, Agricultural Representatives, and other industry participants;

(c) the contractor will also conduct a minimum of 200 in depth telephone interviews with On-Farm Demonstration co-operators and other demonstration participants to determine the perceived value, strengths and weakness of On-Farm Demonstration;

(d) the contractor will conduct a minimum of 10 case studies which are representative of the sectors demonstrated by the projects. If possible cases should be selected that demonstrated successful technology transfer and some cases that failed to transfer technology;

(e) write final report taking into account all points outlined in Appendix "A" point 2 and the recommendations from Phase I of the study.

APPENDIX B

"Policy for Locally Initiated FarmLab Projects"

(April 1981)

Regional Extension
Services Branch
Walter Scott Building
3085 Albert Street
Regina, Saskatchewan
S4S 0B1

POLICY FOR LOCALLY INITIATED FARMLAB PROJECTS

April 1, 1981 to March 31, 1982

A. Purpose

1. To encourage development and implementation of local on-farm research and demonstration projects throughout rural Saskatchewan. FarmLab Committees will provide local leadership and make decisions on financial assistance for local projects.

2. To provide financial assistance to farmer co-operators for local on-farm projects, based on costs incurred above normal operating costs.

B. Definition of Terms

1. Ministers' Advisory Committee on Research: a Provincial Committee comprised of representatives from Saskatchewan farm organizations and other farmers based on geographic distribution. This Committee provides advice on overall operation and co-ordination of the FarmLab program.

2. FarmLab Committees: these committees are responsible for establishing priorities for locally initiated projects and for reviewing, approving and monitoring all on-farm research and demonstration projects to be implemented in their FarmLab area. There are twelve local committees covering the agricultural area of Saskatchewan.

3. Co-operators: those farmers who have a FarmLab research or demonstration project implemented on their farm.

4. Local FarmLab Projects: these are on-farm projects which demonstrate an innovative farming practise or conduct a field experiment which addresses a local agricultural production problem within the priorities of the Saskatchewan FarmLab program.

C. General (Overview of FarmLab Program)

The FarmLab Program is a commitment by the Provincial Government to agricultural research which joins the expertise of Saskatchewan's farmers whith the expertise of Department of Agriculture staff and University scientists to increase agricultural production while maintaining or increasing soil productivity. $25 million has been committed to FarmLab over five years beginning April 1, 1981.

The FarmLab program has two major components which are closely related and operate on a complementary basis. One is a contractual arrangement between the Provincial Government and the University of Saskatchewan to conduct research into specific agricultural issues identified on an annual basis after consultation with the Minister's Advisory Committee on Research and FarmLab Committees. Some of this contractual research will be done in University facilities; however, wherever possible, the research will be done on farms after review of proposals by FarmLab Committees. Funding arrangements for the University component of the FarmLab program are not covered by this policy statement.

The second major FarmLab component is locally initiated on-farm research and demonstration projects. Projects may be proposed by farmers, other individuals or local groups and organizations. FarmLab Committees will be responsible for reviewing project proposals to determine their suitability within local agricultural priorities and overall priorities of the FarmLab program. The local Committees will match approved projects with farmer co-operators and will determine the level of financial assistance for implementation of local projects.

This FarmLab policy deals only with the procedures and financial assistance that will be provided for the second component of FarmLab (i.e. locally initiated on-farm research and demonstration projects).

D. Eligibility

1. Any farm operator may apply to be a co-operator by filling out a "FarmLab Co-operator Registration" form which is available from all Agricultural Representatives. The FarmLab Committees will select co-operators for on-farm University research projects and locally initiated on-farm projects.

2. Project proposals for locally initiated on-farm projects may be submitted by farmers, other individuals, groups or organizations. A "FarmLab Project Proposal" form should be completed in consultation with an Agricultural Representative. The FarmLab Committees will review all project proposals and will make decisions on which projects to approve.

3. Financial assistance will be available only to FarmLab co-operators who have approved projects implemented on their farms.

4. Department staff and University scientists will provide technical assistance, as time allows, to all farmers interested in applying innovative farming practises on their farms (i.e. to FarmLab co-operators and all other producers.)

E. Assistance Available

FarmLab Committees will allocate financial assistance for local on-farm projects, based on the following terms and conditions. Payments will be made through the Department of Agriculture's payment system.

1. Payments to co-operators will be for up to 100% of approved costs above normal operating costs (i.e. to cover the difference between normal operations and total costs for the project). FarmLab Committees will be responsible for reviewing and approving cost figures on normal operating costs and project costs.

2. Eligible costs will include but not be limited to the following: fertilizer, herbicides, pesticides, feed supplements, special equipment rental, casual non-family labour, special seed. The Executive Secretary for the FarmLab Committee will be responsible for reviewing any non-routine or questionable cost items with the Deputy Minister's Office before a commitment is made to cover such costs.

3. Co-operators and other family members will not be compensated for time spent on projects; reasonable and necessary casual non-family labour will be an eligible cost.

4. Land rental, interest charges and capital acquisitions by co-operators will not be eligible costs.

5. The amount of annual eligible costs for each project will be determined by the FarmLab Committee at the time of project approval. A contract between the FarmLab Committee, acting on behalf of the Department of Agriculture, and the co-operator will be completed before each project is implemented. This contract will establish a maximum payment for the project. This maximum may be adjusted at a later date in exceptional circumstances where approved by the FarmLab Committee.

6. The Department of Agriculture will not guarantee co-operators normal economic returns on resources committed to projects and will not be responsible for any other losses claimed by co-operators due to operation of FarmLab projects. Co-operators will take the benefit of greater than normal returns on projects and will bear the risk of losses due to operation of projects.

7. The Department of Agriculture will reimburse co-operators for eligible project costs, as approved by the FarmLab Committee, only after costs are incurred; no input costs for local projects will be paid directly to suppliers by the Department.

8. Co-operators will not be paid an honorarium for having projects on their farms; however, payments may be made by the Department of Agriculture for special services such a field days, speaking engagements, etc. Such arrangements must be approved in advance by the Executive Secretary of the FarmLab Committee.

F. Applications and Procedures

1. Farmers interested in becoming FarmLab co-operators should forward a completed "FarmLab Co-operator Registration" form to their local Agricultural Representative.

2. Farmers, other individuals, and organizations (e.g. Agriculture Extension District Boards, Regional Advisory Councils, RM Councils, RM Agricultural Committees, Agricultural Societies, farm organizations, etc.) with proposals for on-farm projects should complete a "FarmLab Project Proposal" form in consultation with an Agricultural Representative.

3. All project proposals will require review and signature of the local Agricultural Representative and a Department specialist prior to consideration by the FarmLab Committees. University scientists will also be involved in review of project proposals.

4. After review of project proposals by staff, the proposals will be submitted to the FarmLab Committees for approval or rejection. The Committees will also match approved projects with co-operators.

5. The Department, in consultation with the FarmLab Committees, will establish deadlines for annual project proposals in order to allow proper review and implementation.

6. Projects approved by the FarmLab Committees will require the signature of the Executive Secretary to the Committee and the Executive Director of Regional Extension (or designate) prior to final Department approval and local implementation. This is required to ensure proper co-ordination of projects on a regional and provincial basis.

7. After final approval of projects, detailed design work for implementation will be done by the co-operator, Agricultural Representative, Department specialist and University scientists. Local Agricultural Representatives will be project leaders for all local on-farm projects in their respective Districts.

8. A contract will be established between the local Committee, on behalf of the Department of Agriculture, and the co-operator for each approved project. The contract will outline requirements to be met by the co-operator and will establish maximum financial assistance available for the project.

9. Department staff and University scientists will assist co-operators during implementation and operation of projects. Co-operators will be responsible for following proper project procedures and providing a reasonable level of assistance in implementation.

10. All necessary information and records must be provided by the co-operator before the Department of Agriculture will make final payment for approved project costs.

11. Annual reports of progress, results and recommendations will be prepared for each project by Department staff in consultation with co-operators. These will be provided to the FarmLab Committees for review.

Honourable Gordon MacMurchy
Minister

Dr. Gerry J. Gartner
Deputy Minister

SASKATCHEWAN FARM LAB PROGRAM AUG 28 1981

FARM LAB - a program by the farmers, for the farmers.
- a unique organization that not only allows you to participate, but asks for your participation.

Are you ready to share your ideas with your local Farm Lab Committee?

What is the Saskatchewan Farm Lab Program?

1) A program of $25 million over a five-year period for research and farm demonstrations, as announced by the Minister of Agriculture, the Honourable Gordon MacMurchy, at the spring sitting of the Saskatchewan Legislature, 1981.
2) Bringing together the farmer, the University of Saskatchewan and Saskatchewan Agriculture in pursuit of improved farm production by serving the farmers' needs.
3) An organization of 12 Farm Lab Committees, an all farmer membership, responsible for delivering the program at the farm gate.
4) Soliciting your ideas and cooperation to overcome production problems that you as a farmer face through the local Farm Lab Committee.
5) Developing demonstration projects that will assist in finding the answers to the key problems in your farming community.
6) Providing the neighboring farmers, indeed, all the farmer in the province the what and how, you have been able to accomplish to overcome your problem.

... 2

7) Encouraging support for your findings so other farmers can value from your demonstrated experience.

Why do we ask for your ideas and support?

1) It is part of Saskatchewan's heritage to cooperate for achievement. The farm "bee" to put up barns, the community "bee" to put up a skating rink.
2) Our major achievements are the result of cooperation and support. We have very high expectations when we work as a unit.
3) We need everyone's ideas to assure we are doing what you recognize as important problems?
4) With limited funds and personnel to carry out all the projects the Farm Lab Committee must establish some priorities. Make sure your ideas are presented so the priorities can be weighted to cover your need.

How do you get your ideas recognized and supported?

1) Get to know the Farm Lab Committee member in your agricultural district or talk to your agricultural representative about the program.
2) Complete a Farm Lab project proposal and discuss it with your agricultural representative.
3) Complete a Farm Lab Cooperators Registration if you are interested in becoming a demonstration farm cooperator.
4) Your agricultural representative will see that your proposal application and cooperator registration are brought to the attention of the Farm Lab committee for processing.

What will be expected of me as a demonstration cooperator?

1) Provide assistance and equipment in implementation of the project on your farm.
2) Allow Department and/or University personnel to enter your farm as required for purposes of conducting the project.
3) Allow groups and individuals to visit the project.
4) Allow the project to be publicized if considered appropriate by the Farm Lab Committee.
5) Be the farmers advocate in the new technology knowledge you have gained.

When should I apply?

The Farm Lab Committee will accept project ideas and cooperators as they come forward. If you have a project that you want considered for the following crop year, your project outline should be submitted by October 31.

When will I hear if the project is approved?

The Farm Lab Committee would like to review and evaluate all projects by January 15. This will be done in conjunction with the University of Saskatchewan Researcher and the Saskatchewan Agriculture Staff, who resource the project. You should be notified shortly thereafter if the project is approved and/or if you have been identified as a cooperator.

Who will assist me in my project?

The agricultural representative will be responsible for developing and implementing the project through your cooperation.

He may call on the assistance of the University Staff or Saskatchewan Agriculture staff depending on the type of project you undertake.

The staff provided for the project will be available for any assistance you require in the development and implementation of the project.

What financial assistance is available?

The Farm Lab Committee will cover all costs above the normal operating costs.

(Use an example)

Finally, it is important that all projects be evaluated. We have to look at more than the agronomic factors, that is, how well the crop is growing, for example. The project must make dollars for the farmer from the technology sense. The records necessary for evaluation will be discussed with you when completing the project application form.

DRAFT - For Discussion Only

June 10, 1981.

Terms of Reference for Local FarmLab Committees

1. Membership on local Committees:

   - one member appointed by the Regional Advisory Council for the area;

   - one member appointed by the District Board of the Ag Rep Districts involved, (appointed on rotating basis for 2 year term starting with lowest numbered Ag Rep District);

   - two Ministerial appointments per Ag Rep District;

   - members of the Minister's Advisory Committee on Research which live in the area are ex-officio non-voting members of the local committees.

2. Operations:

   - the Regional Co-ordinator for the area will serve as executive secretary to the committee.

   - the Chairman for each local Committee will be appointed by the Minister;

   - the committees will meet as required to fulfill their responsibilities, (estimate of 6 - 8 times per year);

   - appointments for local members are for two year terms, subject to re-appointment.

3. Responsibilities:

   i. To become familiar with the overall operation of the FarmLab Program including its activities within the Department of Agriculture and at the University of Saskatchewan.

   ii. To establish priorities within their area for agricultural research and demonstration projects within overall priorities established for the FarmLab program.

iii. To advise on priorities for Provincial agricultural research to be done through FarmLab (i.e. priorities for the University of Saskatchewan research contract).

iv. To review and approve University of Saskatchewan on-farm research projects that will be operated in the FarmLab area. This includes approval of farm sites for these projects.

v. To encourage development of local Agricultural research and demonstration projects to be conducted on local farms. Project proposals may be developed by farmers, Ag District Boards, Regional Advisory Councils, R. M. Councils, R. M. Agricultural Committees, Department of Agriculture regional staff, Agricultural Societies, etc.

vi. The local FarmLab Committees may direct that project proposals be developed by Department of Agriculture staff for future consideration by the Committees, in cases where proposals are not being developed by other sources to deal with priority problems.

vii. To review and approve all local proposals for research and demonstration projects in the FarmLab area. This includes selection of projects to be funded and selection of farmers for each project.

viii. To make decisions on level of re-imbursement to farmer co-operators for local projects, within guidelines established by the Department of Agriculture. Payments will be approved by the local FarmLab Committees and will be made through the Department of Agriculture.

ix. To review the terms and conditions of contracts drawn up with co-operator farmers to ensure the projects are conducted properly and fairly.

x. To review annual reports of all FarmLab projects operating in the area to ensure projects operate as proposed and continue to deal with high priority problems.

xi. To develop an extension plan to publicize results of local projects, in co-operation with Department of Agriculture regional staff. These may include field days, public meetings, displays at fairs, etc.

APPENDIX C

Summary of Research Contacts

APPENDIX C

EVALUATION OF ON-FARM DEMONSTRATIONS

RESEARCH CONTACTS

Survey	# Contacts
Survey Pretest	16
Complete Survey	157
Contact but refuse	4
invalid selection	40
Total Survey Contacts	217

Case Study	
Host Farmer	6
Ag Rep	13
Specialist	9
Input Supplier	13
Community Leader	9
Local Farmer	10
Total Contacts	60

Other Interviews	
Government	10
Industry	8
University	5
Other	6
	29

APPENDIX D

Case Study Methodology

APPENDIX D

CASE STUDY METHODOLOGY

Ten demonstration projects were selected for intensive case analysis. The purpose of studying each case was first, to obtain insight into the development and consequences of each project and second, to gain an understanding of the information and technology transfer systems operating in each case.

Cases were chosen by considering a number of criteria:

1. source of the project idea
2. extent of involvement in the project by researchers, agriculture councils, district boards, Saskatchewan Agriculture extension staff, and industry representatives
3. the cooperator's role in community organizations such as regional agricultural councils, district agricultural boards, R.M. committees, SARM, etc.
4. the degree of innovativeness of the practice demonstrated
5. the degree of complexity of the practice demonstrated
6. the number of host cooperators involved in the project
7. the extent to which the demonstration was publicized
8. the degree to which the project was research-oriented
9. the extent of the cooperator's wife's involvement in the demonstration
10. the extent to which successful technology transfer took place
11. the region in which the project took place.

In order to examine the role played by on-farm demonstrations in the transfer of agricultural technology in Saskatchewan, both typical and atypical demonstration projects were selected. Typical cases selected were characterized by the following:

1. a single host cooperator
2. project initiation by the ag rep
3. few project participants - usually, only the ag rep, specialist, and host farmer
4. a demonstrated practice that was simple and not particularly innovative
5. a low level of publicity.

For the atypical cases, projects displaying one or more of the following characteristics were selected:

1. high involvement by a number of participants - researchers, Saskatchewan Agriculture extension staff, farmers, industry representatives, etc.
2. multiple cooperators involved in the same project
3. a highly innovative, farmer-generated idea as the basis for the demonstration
4. a significant research component - i.e. the practice had not previously been tested in Saskatchewan
5. the initiation of the project was in response to a regional problem or regional interest
6. high involvement in the demonstration by the cooperator's wife.

A conscious effort was made to ensure that all regions were represented in the case study sample and that examples of both successful and unsuccessful technology transfer were included. Cases were also chosen to be representative of the three sectors - soils, crops, and livestock - demonstrated by the projects.

For each case, interviews were conducted with a selected sample of individuals. The following information sources were sought in each case:

- the host farmer
- the ag rep
- the agricultural specialist involved with the project
- a representative of the company or dealership that supplied the inputs for the demonstration
- a community leader who has a high general awareness of community happenings - for example, Chairman of a District Board, Regional Council or R.M. Council, Mayor, etc.
- an average farmer in the area (other than the cooperator) who might use the practice demonstrated.

Names of specific informants were obtained from the project files, Ag Reps and individuals directly associated with the project.

The total number of each type of respondent contacted was:

TYPE OF INFORMANT	NO. OF RESPONDENTS
host farmer	6
ag rep	13
specialist	9
input supplier	13
community leader	9
local farmer	10
total respondents	60

Individual depth interviews were conducted by telephone and in person and were between 1/2 to 1 1/2 hours in length. Informants were asked to relate:

a) their role (if any) in the project
b) the roles of other participants in the project
c) their opinion of the success of the project
d) their knowledge of the past and present use of the demonstrated practice in the community
e) ways the demonstration was publicized (if any); and
f) their opinion about various aspects of on-farm demonstration.

APPENDIX E

Survey Questionnaire

with

Raw Data Scores

Brystra
consultants

RESPONDENT I.D. NO.	_____	
INTERVIEW I.D. NO.	_____	1-3
REGION	_____	4
DISTRICT	_____	5-6
YEAR	_____	7-8
RESPONDENT:		
COOPERATOR IN CONTRACT	1	9
OTHER PARTICIPANT	2	
AG REP	3	

AGRICULTURE DEVELOPMENT FUND

ON-FARM DEMONSTRATOR SURVEY

MARCH 1987

INTERVIEWER NAME

INTERVIEWER ID NO.

Brystra consultants

District	# of farms	Percent
North East	20	27
North West	25	17.8
Central - East	10	6.4
Central - West	30	19.1
South - East	24	15.3
South - West	45	28.7

START TIME: _____

PIGS #	PIGS %
0	— 89.8
1 - 30	— 5.7
31 - 50	— 1.3
51 - 250	— 1.9
251 +	— 1.3

CATTLE #	CATTLE %
0	31.4
1 - 30	12.2
31 - 100	24.3
101 - 300	23.8
301 +	8.3

CHICKENS #	CHICKENS %
0	— 84.6
1 - 30	— 8.3
31 - 50	— 5.8
51 - 100	— 1.3

A. FARM OPERATION

1. First, how many years have you personally been farming at your present location?

— — years	< 5	1.3 %
	5-9	15.3
	10-14	32.4
	14-19	12.1
	20-24	8.3
	≥ 25	

10-

2. Have you farmed elsewhere?

16.6% YES 1 12

83.4% NO 2 (GO TO Q.4)

3. (If yes,) what is your total farming experience in years?

— — years	< 15	19.2
	15-19	11.5
	20-29	42.3
	≥ 30	4.5

n = 26

13-

4. What type of farming operation do you have?
(check all that apply) (if sales > 10% of receipts)

cereal crops	1	93.6
specialty crops _____	1	21.7
livestock	1	67.5
other: (specify) _____	1	4.5

15
16
17
18

5. What is the total acreage of the land you presently farm?
(including cropland, pasture land, summerfallow, etc.)

Acres	%
0-69	0.6
70-559	5.8
560-1119	24.8
1120-2239	41.4
2240-3519	19.1
> 3520	8.3

— — — — acres 19-
____ hectares
____ quarters
____ sections

6. Approximately what is the total number of the following livestock and poultry on your farm . . .

. . . cattle and calves	— — — — 23-
. . . chickens	— — — — 27-
. . . pigs	— — — — 31-
. . . any others? (specify) _____	— — 35-

OTHER

#	%
0 —	72.6
1-14 —	24.2
15-16 —	2.6

2.0 million bees - 0.6 %

7. Which of the following best describes your farm . . .

. . . sole proprietorship	1	67.5	37
. . . partnership	2	19.9	
. . . corporation	3	11.5	
. . . institution (e.g. Research Station, university farm, etc.)?	4	0	
Other (specify) _____	5	1.3	

8. How many people, other than yourself, participate in the day-to-day decisions made in the operation of your farm? # __ __ (38-39)

If NONE, GO TO Q.10

0		17.2	
1		57.3	
2		19.7	
3		3.2	40
5		1.9	41

9. What is their relation to you?

spouse	1	55.4	42
son/daughter	1	10.8	43
parent	1	13.4	44
brother/sister	1	15.9	45
in-law (specify) _____	1	2.5	46
no relation	1	1.3	
other (specify) _____	1	2.5	

10. Who on your farm would be involved in making a decision regarding whether or not to adopt a major new farming technique on your farm? (check all that apply)

yourself	1	97.5	47
spouse	1	36.3	48
parent	1	7.6	49
son or daughter	1	12.1	50
brother/sister	1	11.0	51
uncle/aunt	1	0	52
other relative	1	1.3	53
other (specify) _____	1	2.5	54

B. PROCESS OF DEMONSTRATION

Now, we have a few questions about the demonstration that was carried out on your farm.

11. First of all, how many years did your demonstration last?

____ years	1	30.3	55
	2	24.2	
	3	12.1	
	4	3.0	
	5	9.1	
	9	1.	

12. Did the project last as long as it was supposed to? 56

yes	73 09	1	(GO TO Q.14)
no, quit early	3 3	2	
no, went longer	1 3	3	(GO TO Q.14)
	17 8		
	.6		

13. (If the project quit early), why did the project end early? 57

weather	1	57.1
pests (e.g. grasshoppers)	2	7 1
other (specify)	3	14 3
Poor seed		7.1
Poor management Planning		7 1
Grain Price Decrease		7 1

Now, I'll be asking a series of questions about the demonstration starting from the original idea. Thinking back to the beginning of the project, can you tell me. . .

14. Where did you first get the idea for this demonstration project? 58-

self	01	12 7
university researcher	02	.6
ag rep	03	42.7
district council member	04	3.8
regional council member	05	.6
provincial specialist	06	5.1
relative who also farms	07	1 3
other farmer	08	5.7
neighbours	09	1.9
publication (specify)	10	13.4
other (specify)	11	12.1
(place for multiples)		

15. Where did you first hear of the FarmLab demonstration program? 60-

spouse	01	0
ag rep	02	56.1
newspaper (specify)	03	4.5
magazine (specify)	04	0.6
T.V.	05	1.3
radio	06	3 2
other farmer	07	4.5
don't recall (probe)	08	2 5
neighbours	09	0.6
other (specify)	10	26.8

16. What was the main reason you decided to participate in the FarmLab demonstration program for this project? Was it mainly because you. . . (check all that apply)

. . . wanted to test the idea to see if it would work on your farm?	1 83.5	62
. . . acted as the test site for several farmers in area?	1 32.5	63
. . . were encouraged to participate by ag rep or provincial specialist?	1 30.6	64
. . . or other reasons? (specify)	1 12.1	65

17. The next set of questions deals with your opinion of various aspects of the demonstration on your farm. I'm going to ask you to tell me whether or not you agree with several statements. Please tell me if you agree strongly or moderately, or disagree strongly or moderately with each statement.
The first statement is: ...

17.1 The people responsible for the program were efficient in handling my application to participate. Would you agree strongly, agree moderately, disagree moderately or disagree strongly?

1 73.4 2 24.4 3 1.3 4 1.3 5 0 — 66
strongly agree agree neutral disagree strongly disagree

17.2 Before the demonstration, I had my own ideas as to what the results of the test would be.

1 15.9 2 41.4 3 10.8 4 25.5 5 6.4 — 67
strongly agree agree neutral disagree strongly disagree

17.3 The demonstration turned out as I expected it to.

1 16.6 2 35.7 3 7.6 4 23.6 5 3.8 — 68
strongly agree agree neutral disagree strongly disagree

17.4 Other farmers in the area benefitted from the demonstration on this farm.

1 20.4 2 47.8 3 10.8 4 11.5 5 3.2 — 69
strongly agree agree neutral disagree strongly disagree

17.5 I benefitted personally from holding the demonstration on my farm.

1 52.2 2 41.4 3 1.3 4 1.9 5 1.9 — 70
strongly agree agree neutral disagree strongly disagree

17.6 The demonstration was well worth the time and money put into it.

1 61.8 2 34.4 3 2.5 4 0.6 5 0.6 — 71
strongly agree agree neutral disagree strongly disagree

18. Did you receive any financial compensation for your non-labor expenses associated with the project?

YES	89.9	1	(GO TO Q.20)	72
NO	9.6	2		
Don't Know	0.6			

19. (If no),
Was any offered? YES 13.3 (1) NO 86.7 (2) n=15 73

20. Did you feel the compensation was adequate?
1 1.4 Not at all; 2 2.8 Not adequate; 3 89.4 Adequate; 4 6.3 Very Generous 74
n=142

21. Did the program provide adequate technical assistance?

YES	84.7	1	75
NO	14.6	2	
None Needed	0.6		

22. (If no,) what was needed? 76

None provided	8.7
More follow-ups	4.3
Aid Eval Results	13.0
Advice	21.7
Other Assistance	52.2

C. TECHNICAL COMPONENT OF DEMONSTRATION

23. Did the demonstration produce clear results from which you could make definite conclusions? 77

yes	1	63.1
only partly	2	15.3
no, the results were inconclusive	3	14.6
ongoing		5.1
Not use-		1.3
		0.6

24. How successful was the innovation itself? 78

very successful	49.7	1	(GO TO Q.26)
somewhat successful	38.2	2	
not at all successful	7.6	3	
on going	3.2		
Crop Failure	1.3		

25. (If the innovation was unsuccessful,) Why didn't the innovation work? 79-80 CARD 1

Drought	23.5
Poor Tech. Assist.	1.3
Winter Kill	6.5
Longer Wider Test	7.8
Too Expensive	6.5
Poor Germination	1.3
Other	6.5
No Comment	46.8

26. How many of the farmers in your ag rep district could benefit from the innovation tested on your farm? Would that be ...

: 1.7 2 16.3 3 39.2 4 26.8 5 17.0 2
none few some most all

n = 153

27. How many of those farmers were already using the innovation at the start of your demonstration? (Read alternatives in Q.26)

: 51.3 2 36.8 3 10.5 4 1.3 5 0 3
none few some most all

n = 152

28. How many were using it one year after the start of the demonstration? (Read alternatives in Q.26)

: 29.8 2 39.7 3 25.5 4 4.3 5 0.7 4
none few some most all

29. How many do you expect will be using it 5 years after you finished the demonstration? (Read alternatives in Q.26)

: 10.9 2 [illegible] 3 37.7 4 17.8 5 0.6 5
none few some most all

Depend on market 3.8 n = 138

30. To what extent are you currently using the innovation on your farm. . .

fully adopted it 1 36.3 6
on part of the farm 2 40.8 n = 157
not at all (GO TO Q.33) 3 14.6
ongoing 1.9
with [illegible] is right 4.9
other

31. Are you using it as it was tested during the demonstration or have you made some changes? 7

using it as tested 1 47.6
made changes 2 49.2 n = 126
ongoing 3.2

32. Did you do any further test runs, after the official demonstration, before you started using the innovation? 8

yes 1 32.8
no 2 56.8 n = 125
ongoing 10.4

33. Was an economic assessment made of the results? 9

yes 58.11
no 27.72 (GO TO Q.35)
not yet 7.13
ongoing 3.2 n = 155
Project finished 3.9

34. (If yes,) Did/will the economic assessment show that it would be beneficial for most of the farmers in your district? 10

yes 1 59.6
partially 2 22.3 n = 94
no 3 14.9

D. COMMUNICATION MODEL

35. During the (first) year of the demonstration, approximately how often did you contact the following people for information to help you set up this demonstration ...

	TIMES PER YEAR				
	NEVER	1-4	5-8	9-12	> 12
. . . other farmers	0 48.7	1 26.8	2 9.2	3 0.4	4 1.3
. . . ag district council members	0 67.5	1 24.4	2 7.1	3 0.4	4 0.6
. . . ag rep	0 5.1	1 47.4	2 29.1	3 13.4	4 4.4
. . . university researchers	0 72.7	1 22.6	2 3.2	3 1.2	4 1.3
. . . farm organizations	0 96.1	1 3.2	2 0.4	3 0	4 0
. . . regional specialists	0 44.7	1 28.0	2 15.7	3 1.2	4 0.6
. . . provincial specialists	0 70.2	1 17.1	2 3.9	3 3.9	4 0.6
. . . elevator agent	0 58.4	1 10.2	2 2.4	3 1.9	4 0.8
. . . company rep	0 80.1	1 16.7	2 2.2	3 0.1	4 0.6
. . . any others: (specify)	0 92.4	1 3.9	2 1.9	3 1	4 1.9

36. Of those people you contacted, who was the most valuable? (Circle only one)

other farmers	01 1.3
district council member	02 0.6
ag rep	03 66.9
university researcher	04 1.9
regional specialist	05 8.9
farm organizations	06 0
company rep	07 3.8
provincial specialist	08 3.3
elevator agent	09 0
other (specify)	10 2.5

37. Did any tours visit the site?

YES	1 35.7
NO (GO TO Q.40)	2 63.1
Don't know	1.3

38. About how many tour groups visited the site?

1-9 ?
2 8.3
3 3.7
4 0.8

39. About how many people were there on each tour on average?

4-10	17.3
11-20	46.2
21-35	13.5
36-50	17.3
51-100	5.8

40. Now, excluding those tours, how often did the following people visit the demonstration site...

	TIMES PER YEAR					
	NEVER	1-4	5-8	9-12	> 12	
. . . other farmers	0 24.7	141.3	2 12	3 8.0	4 14.0	29
. . . ag district council members	0 66.9	1 27.9	2 2.7	3 0.7	4 1.3	30
. . . ag rep	0 10.6	1 52.0	2 21.4	3 9.3	4 6.7	31
. . . university researchers	0 79.6	1 16.7	2 2.6	3 1.3	4 0.7	32
. . . farm organizations	0 94.7	1 4.0	2 0.7	3 0.0	4 0.7	33
. . . regional specialist	0 14.4	1 72.0	2 5.9	3 0.7	4 0.0	34
. . . provincial specialists	0 78.6	1 12.0	2 3.3	3 0.0	4 0.0	35
. . . elevator agent	0 90.9	1 5.3	2 1.3	3 0.7	4 0.0	36
. . . company rep	0 89.9	1 7.4	2 1.3	3 0.7	4 0.7	37
. . . any others: (specify)	0 92.1	1 5.3	2 1.3	3 0.7	4 0.7	38

41. What would it take to get more farmers to visit the demonstration site? (Circle all that apply -- DO NOT READ)

food and beverages	1 1.9	39
organized bus tours	1 5.3	40
press coverage	1 1.4 6	41
give-aways (e.g. hats)	1 0.6	42
things for the family to do	1 0	43
other 1 (specify)	1 58.0	44
other 2 (specify)	1 6.4	45

42. What information should be provided at the site for occasional visitors? (circle all mentioned)

signs	1 61.8	46
hand-outs	1 29.9	47
phone number	1 5.7	48
names	1 7.0	49
addresses	1 1.3	50
other 1 (specify)	1 28.7	51
other 2 (specify)	1 2.5	52

43. How often have the following people contacted you for information about your demonstration since it ended . . .

	NEVER	TIMES PER YEAR 1-4	5-8	9-12	> 12	
. . . other farmers	0 20.0	44.4	24.9	36.9	4 15.2	53
. . . district council members	0 77.9	1 11.0	2 0.9	3 5.6	4 0	54
. . . ag rep	0 22.5	1 44.4	2 11.0	3 22.5	4 2.8	55
. . . university researchers	0 81.7	1 7.6	2 0.7	3 0	4 0	56
. . . farm organizations	0 97.2	1 2.8	2 0	3 0	4 0	57
. . . regional specialist	0 77.2	1 14.7	2 1.4	3 0	4 0	58
. . . provincial specialists	0 82.1	1 6.4	2 0.7	3 0.7	4 0	59
. . . elevator agent	0 96.2	1 1.9	2 0	3 0	4 0	60
. . . company rep	0 98.1	1 1.9	2 0	3 0	4 0	61
. . . other: (specify)	0 85.9	1 2.8	2 0.7	3 0.7	4 0	62

44. Did you receive a copy of the final report?

yes	1		63
no (GO TO Q.47)	2		

Yes 68.0
No 11.5
ongoing 1.7
Yes: Interim 10.2
No: crop failure 2.5
Yes: Report not Final 1.7
No: No Interim 5.7
Don't Know 2.5

45. (If yes,) do you think the final report was an accurate description of what actually happened?

yes	1 75.0	Interim-Yes	10.5	64
yes - conditional	2 7.7	Interim Yes-Cond.	1.7	
no - conditional	3 1.7	Interim-No	0 3	n=120
no	4 1.7			

46. Would the report help your neighbours make an intelligent decision about this innovation?

yes	1 73.1		65
no	2 10.9	n=120	
Interim-yes	9.2		
Interim-no	3.5		
Partially	3.2		

47. With whom did you personally discuss the final results of the project? (check all that apply - DO NOT READ)

no one	1 5.1	66
ag council members	1 10.8	67
ag rep	1 25.5	68
university researcher	1 7.1	69
other farmers	1 40.5	70
company rep	1 1.5	71
media (press)	1 0	72
Saskatchewan Department of Agriculture	1 0	73
regional specialist	1 18.6	74
provincial specialist	1 13.4	75
other (specify)	1 8.9	76
Ins agent	1.3	

77-78=02

79-80=01

48. Were there any other ways the demonstration on your farm was publicized
For example, did it receive any coverage on . . .
(check all that apply)

. . . T.V.	1 8.3	1
. . . radio	1 11.5	2
. . . newspaper/magazine articles	1 33.1	3
. . . signs posted near test site	1 34.1.	4
. . . special mailings	1 14.0	5
. . . Ag Rep's newsletter	1 67.5	6
. . . other (specify)	1 15.9	7
_____	—	8

Nothing 20.2
Agrep news 7.2
Local Paper 12.9
Local Paper/ Signs 3.6
Signs 3.6
Signs + other 2.2
Other 33.1

(Do Not Read)
Word-of-mouth 1 20.4 9

49. What else could be done to publicize a demonstration of this type? _____ — 10

n = 139.

50. Overall, how well do you think the message about your demonstration was transmitted to the people who could benefit from it?

nothing transmitted	1 4.5	11
poorly	2 19.7	
so-so	3 15.3	n = 157
pretty well	4 56.1	
everybody got the message loud and clear	5 2.5	
Too soon to tell	0.6	
Don't know.	1 2	

51. Since the demonstration ended, has there been any other follow-up by yourself or by others? If so, what?
2 = no 52.9 1 = yes 34.4 undecided 0.6 ongoing 10.8 12
feed test 1.3
yes (others) 10.8 0-1? — 13
yes (self) continue to test 7.9.6 — 14
continue to monitor 2.4
others 22.0

52. Have you ever been involved as the host of another demonstration project? (If yes, probe for number)

Yes, several	1 12.7	15
Yes, one	2 19.1	
No - (skip to Q.54)	3 68.2	

53. (If yes,) Who was the sponsor? (check all that apply).

FarmLab	1 10.8	16
Ag Development Fund	1 4 5	17
other government	1 3.8	18
private company	1 12 7	19
Producers Association	1 1 3	20
other (specify) _____	1 7 0 —	21

E. PSYCHOGRAPHICS

As a participant, you play an important role in our farm community. Our researchers would like to know a bit more about you so they can make these demonstration programs as effective as possible.

54. There are many sources of information on new farming practices. We are interested in knowing which sources you use to learn about new farming ideas.
Thinking of printed material, would you use:

	YES	NO	Most useful	Second	Third	
			22.3	16.6	14.3	23
. . .The Western Producer	91.1 1	8.9 2				
. . .Farm Light & Power	91.1 1	8.9 2	2.5	6.4	12.9	24
. . .Grain News	89.2 1	10.8 2	29.9	22.3	6.8	25
. . .Ag Rep's Newsletter	9 1	2				26
Now, how about . . .						
. . .radio						
(station/program: _____)	66.9 1	33.1 2	0.6	8.3	6.8	27
television						
(station/program: _____)	69.4 1	30.6 2	1.9	2.5	7.5	28
. . .The Leader Post	5.7 1	94.3 2	0	0	0	29
. . .The Star Phoenix	5.7 1	94.3 2	0	0.6	0	30
. . .weekly newspaper (specify) _____	41.4 1	58.6 2	1.9	3.8	6.1	31
. . .other farmers	94.3 1	5.7 2	8.9	5.7	4.8	32
. . .farm organizations	60.1 1	39.9 2	1.3	1.3	0	33
. . .agriculture - related seminars	84.7 1	15.3 2	10.2	6.4	15.6	34
. . .other (specify) _____	70.2 1	29.8 2	12.7	15.3	15.6	35

55. O.K., you just mentioned . . . (re-read all mentioned) . . . as sources. Now, which of those do you find . . .

. . . the most useful	_ _	36-37
. . . and the next	_ _	38-39
. . . and the next	_ _	40-41

(Code up to 3)

56. We are interested in knowing if you have made any trips to other farm operations, whether in Saskatchewan or elsewhere, for the purpose of gaining new technical information. Would you say that you have made any such trips in the last 10 years?

yes	1	82.8	42
no (GO TO Q.58)	2	17.2	

57. About how many of those visits were made . . .

. . . within Saskatchewan	09.4	43-44
. . . elsewhere on the Prairies	19.0	45-46
. . . to other parts of Canada or the U.S.	37.6	47-48
. . . outside Canada and the U.S.	25.9	49-50

58. Now, I am going to read you a list of things that may influence others to adopt the innovation. For each criteria, I would like you to tell me if you consider it ... very important, quite important, just a little important, or not at all important.

	VERY	QUITE	JUST A LITTLE	NOT AT ALL	
. . .visibility of plot, signs, etc.	151.9	23.5	310.8	43.2	51
. . .reputation of host farmer	139.5	247.1	311.5	41.3	52
. . .reputation of sponsor (e.g. government, corporations)	153.1	295.2	314.6	46.4	53
. . .communication of the results	172.0	226.1	30.6	40.6	54
. . .economic results	173.9	221.1	35.2	40	55
. . .similarity of test site to other farmers' farms	182.1	297.1	314.8	41.9	56
. . .technical proof	144.9	294.0	39.4	40	57
. . .anything else important? (specify)	165.3	22.5	30	40	58

59. Do you believe that government-sponsored demonstrations are less biased than ones sponsored by private corporations?

yes	1 71.8	59
yes, usually - depending on the private corp. involved	2 11.5	
no difference	3 14.6	
no, corp.-sponsored demos are usually less biased	4 0.6	
DON'T KNOW	1.3	

60. Apart from the technology you demonstrated under FarmLab, for the last major change you made in your own farm operation, how important were the following:. . .

	VERY	QUITE	JUST A LITTLE	NOT AT ALL	
. . . ag rep's opinion	22.61	43.92	20.03	13.54	60
. . . manufacturer or sales agent's product information	14.21	40.02	34.83	11.04	61
. . . neighbour's opinion	11.01	36.32	29.03	23.63	62
. . . neighbours' practices	19.51	42.92	20.83	16.94	63
. . . provincial specialist	24.01	41.62	21.13	12.34	64
. . . university researcher	29.41	33.32	20.53	17.04	65
. . .own test runs	74.21	23.92	0 3	1.94	66
. . .professional advisor	21.01	28.72	27.13	43.24	67
(lawyer, accountant, etc.)					68-0
. . .other (specify) _____	7.61	6.42	0.63	0.64	69

F. DEMOGRAPHICS

I have just a few more questions about you and your household.

61. How many generations of your family have farmed in Canada?

_____ generations

1 0.6
2 12.7
3 66.2
4 14.6
5 4.6
6 1.3
12 0.6

70

62. How many generations of your family are currently operating this farm?

_____ generations

1 51.0
2 46.5
3 2.5

71

63. Of those _____ generations, which do you represent . . . (read as needed)

oldest	1	15.3
second oldest	2	1.9
third oldest	3	31.8
youngest	4	51.0

72

64. Thinking now about your farm finances for 1986, would you say your net farm income after operating expenses was ...

A. Above or below $25,000

Above 1 28.1 Below 2 71.9

73

B. Would it have been in the range of: ...

25-35	5 15.9	15-25	4 15.6	74
35-50	6 2 8	5-15	3 24.1	
50+	7 9.0	0-5	2 12.7	
		less than breakeven	1 17.2	

65. Would you consider the 1986 net income typical for your farm in recent years?

Yes 32.7 1 (GO TO Q.67) 75
No 67.3 2

66. If no,
Was the 1986 figure higher or lower than normal?

higher 1 14.3 76
lower 2 85.7

67. What percentage of your household income is derived from farming...

. . .< 50% 1 8.4 77
. . .50 - 90% 2 27.3
. . .more than 90% 3 64.3

78-0
79-80-03
CARD 1

68. Now, in terms of your education, what grade have you completed?

< Grade 8 1 3.2
Grade 8 2 8.3
some high school 3 24.2
Grade 12 4 64.3

69. Have you taken any post-secondary education at an institute, or university?

Yes 1 49.0 2
No (SKIP TO Q.71) 2 51.0

70. (If yes,) What level have you completed?

some technical, no certificate/diploma 1 16.9 3
complete technical 2 22.1
some university, no certificate/degree 3 26.5
university Bachelor degree 4 26.6
university graduate degree 5 3.9
University Certificate 16.4

71. In what area was your highest formal education?
(If only high school, was it academic or technical?)

general academic 1 51.1 4
agriculture 2 28.4
business 3 2.2
education 4 3.6
trades (technical) 5 10.1
other professions 6 1.7
other (specify) 7 2.9

72. Did you receive any of your formal education outside of Saskatchewan?

yes, all		1 2 5.	5
yes, some		2 7.6	
no	(GO TO Q.73)	3 [illegible]	

(If yes), Where?

within Canada	1 [illegible].3	6
outside Canada (specify)	2 [illegible].[illegible]	

n = 16

73. Have you ever attended a short course or seminar relating to agriculture given by a university, farm organization, ag rep office or other organization?

Yes		1 86.6	7
No	(GO TO Q.76)	2 14 6	

74. How many such courses or seminars have you attended in the last 5 years?

0	14.1	
1-5	51.5	
6-10	14 8	8-9
10	19.2	

75. Which organization was the sponsor of most of those courses?

Ag rep. district (22.2) U of SaSK 10 9 Prov. Agric. 30.4 10
Fed. Agriculture 0.7 SaSK Pool 0.7 n = 135

76. Where were you born?

in Saskatchewan	94.91	(GO TO Q.79)	11
outside Saskatchewan	5.1 2		

77. If outside Saskatchewan,
Were you born elsewhere in Canada?

yes	(GO TO Q.79)	1 50.0	12
no		2 50.0	

78. If no,
How many years have you lived in Canada?

__ years	11	25.0	13-14
	38	25.0	n = 4
	56	25.0	
	65	25.0	

79. Do you use a computer in your farm operations? 15

no	1 65.6
yes	2 15.5
plan to	3 16 [illegible]
have, but don't use	4 2 5

80. Your age would be: (pause, then read categories if necessary) 16

18-24	1	6.0
25-34	2	29.9
35-44	3	35.7
45-54	4	15.3
55-64	5	15.1
65 or over	6	2.5

81. Finally, have you any general comments about the FarmLab demonstration program? Are there any improvements you think should be implemented? 17

No comment	8.9
No improv. needed	14.6
Other positive	28.0
Other negative	4.5
Mix - pos. + neg.	4.5
Specific recommend	35.0
All Other remarks	4.5

82. Would you consider hosting another demonstration? 18

yes	1	93.0
no (why not?)	2	7.0

19

Did you find this survey interesting? 20

yes	1	94.3
no	2	5.7

Thank you for your interest and cooperation. It is much appreciated.

Interviewer's Remarks:

1. Comments (R = Respondent's; I = Interviewer's) 21

22

3. Sex of respondent

Female	1	23
Male	2	
unknown	3	

4. Respondent's attitude:

hostile	1	24
neutral	2	
cooperative	3	

5. End Time: ____

INTERVIEWER: _____ 25
SUPERVISOR: _____
CODER: _____
DIRECTOR: _____

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APPENDIX F

Farm-Level Profile: Methodological Details

F1: Factor Analyses

F2: Cluster Analyses

APPENDIX F: PROFILES OF THE OFD HOSTS

1.0 FACTOR ANALYSIS

Factor analysis was used in an attempt to segment the participants into identifiable groups. The factor analysis technique examines the inter-correlations among variables to assess the correlation of each variable with common underlying factors. The common factor is not measured or identified in the analysis, rather it is inferred according to the cluster of strongly intercorrelated variables.

Forty-six variables were used in the factor analysis. The initial factor analysis showed that there were 16 underlying factors with an Eigenvalue of 1 or greater. These 16 factors explained 69.4% of the variation within the data set. In order to isolate the data set to five factors the benchmark Egenvalue was increased to 2.5. The five remaining factors accounted for only 53.1% of the variation within the data set. A list of factors and the percentage of variation explained by each is as follows:

Factor	% of Variation
1	10.0
2	6.8
3	6.0
4	5.3
5	5.0
	33.1%

The low amount of variation explained by the five factors indicates that they do not account for much of the variance in the data. Consequently, the descriptive ability of the factors is low. Since it had been expected that the variables would effectively identify several coherent groups of OFD hosts this result suggests that either the data or the hypotheses are flawed.

The variables which are descriptive of a factor can be identified by the strength of their correlation with the factor. By interpreting these correlations, the underlying factor may be identified. However, in this case, since the percentage of variation explained is low, a caveat must be included. Strong conclusions about the relationship between the factor and the variables which describe it cannot be made.

In the analysis, the factors are identified as characteristics of groups of innovators based on the variables with which they are strongly correlated. The factors and related variables are shown in Exhibit 33.

1.1 Innovators (Specialty Crop Group)

Factor 1 is identifed as a tendency towards innovation. The participants in this category are biased towards specialty crops. In many cases they have hosted other demonstrations, and travelled in Saskatchewan and abroad for information on new farming techniques. This group is also more likely to use computers.

1.2 Community Leaders

Factor 2 is identified as those participants who were encouraged into the demonstration program by the Ag Rep. These participants are older and more established than others. The Ag Rep was more active in setting the demonstration, visiting the site and contacting the farmer about the results. The participant's motivation for participating in the program is to serve as a test site for farmers in the area. The participants are often contacted for results by other farmers, probably at the Ag Rep's referral.

1.3 Young Innovators

Factor 3 is a characteristic of the young, well educated farmers who, according to technology transfer models, should be active in innovation. The characteristics of these participants include better education and younger age. The parent is involved in day-to-day decisions and in the decision to adopt new innovations. This younger group attend more seminars than other participants and travel for information on new farming techniques. They are also active in the use of computers on the farm.

Exhibit 33

Factor Analysis

LABEL	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5
HIGHEST LEVEL COMPLETED EDUCATION	.16143	.01340	(.63552)	.14364	.65491
TOTAL ACREAGE PRESENTLY FARM	.02189	.27070	.16673	(.57677)	-.60334
FARM OWNERSHIP:SOLE PROP.(1)VS.OTHER(0)	-.69443	.14876	-.19245	(-.74811)	.08345
TOTAL YRS. FARMING EXPERIENCE(A1-A3)	.65929	.23736	(-.50219)	.27824	.63535
CEREAL CROPS ONLY (A4)	.29785	-.17152	-.28046	(-.64054)	.04733
CEREAL CROPS & LIVESTOCK (A4)	(-.51146)	.21343	-.09971	(.53729)	.10433
ANY SPECIALTY CROPS (A4)	(-.67605)	-.09684	.27707	.14732	-.19633
NET INCOME BEFORE AFTER OPERATING EXPENSE	.19817	.17441	.22373	(.49087)	-.29219
PERCENT HOUSEHOLD INCOME FROM FARMING	-.13874	-.11536	.12472	.21975	.22190
# GENERATIONS OF FAMILY FARMED IN CANADA	(.36672)	.02192	-.13621	.12233	.22619
# COURSES/SEMINARS ATTENDED: LAST 5 YRS.	.10122	-.12866	(.35877)	.15574	-.17241
IN DAY-TO-DAY: DECISIONS- SPOUSE ?	-.04767	.05574	.19327	(.49276)	-.63753
IN DAY-TO-DAY: DECISIONS- SON-DAUGHT. ?	.13776	.01275	(.36451)	.11282	-.21294
DECISION TO ADOPT NEW TECHNIQUES- SELF	-.06423	.03471	-.05879	.14262	-.02552
DECIDE NEW TECHNIQUES: SPOUSE ?	-.03842	-.07149	.12695	(.65457)	-.06678
DECIDE NEW TECHNIQUES: SON-DAUGHT. ?	.00575	(.32228)	(.37729)	(.35753)	.04706
FIRST GOT IDEA FOR DEMO FROM SELF(1)	.02196	.04379	.12111	-.14379	-.21201
FIRST GOT IDEA FOR DEMO FROM AGREP(1)	.02325	-.14918	(-.48026)	.02371	-.03953
PARTICIPATED: TEST IDEA ON OWN FARM	.04431	-.15252	-.34195	-.20274	-.24225
PARTICIPATED: TEST SITE FOR AREA FARMS	-.03417	(.35668)	.08150	-.03693	(.37211)
PARTIC.PARTLAB AS ENCOURAGED/OTHER(1)	.18809	.27686	-.10232	.00819	(.30555)
CONTACTED FOR SET-UP BY: AG REP	-.02150	(.32911)	-.12559	.10278	-.19973
VISIT DEMONSTRATION SITE: OTHER FARMERS	(.31643)	(.32423)	.02131	.03797	-.03540
VISIT DEMONSTRATION SITE: AG REP	.11978	(.35468)	-.20109	-.06613	-.10245
CONTACTED FOR INFORMATION BY: OTHER FARM	-.00258	(.62577)	(.31454)	.10460	-.07017
CONTACTED FOR INFORMATION BY: AG REP	.14896	(.61929)	.01567	-.06520	-.15372
EVER HOST ANOTHER DEMO PROJECT?	(.61270)	.35756	.03726	-.03571	-.05434
SPONSOR OF OTHER PROJECT: PRIVATE COMP.	(.61605)	.01674	-.22712	.01893	-.09275
USEFULNESS OF WESTERN PRODUCER	-.14276	.04075	(-.38325)	.04271	.02123
USEFULNESS OF GRAIN NEWS	.22902	-.02555	-.24690	.02715	(.35545)
USEFULNESS OF AG.REP'S NEWSLETTER	-.26696	.04356	.23190	.11647	-.08163
ANY TRIPS FOR NEW TECH.INFO	.23261	.17334	(.32568)	.04138	.04270
TRIPS TAKEN IN SASKATCHEWAN	(.53578)	.23661	.26315	.15477	-.12344
TRIPS ELSEWHERE ON PRAIRIES	(.56751)	.21834	.18570	.07994	.07239
TRIPS TO OTHER CANADA OR U.S.	(.56772)	(.32055)	.35520	.11462	.09534
TRIPS OFF NORTH AMERICA	.23815	-.17491	.14637	(.41651)	-.23521
LAST CHANGE: AG REP INF.	.22683	-.10995	.25554	.35029	(.31112)
LAST CHANGE: PRODUCT INFO INF.	-.09436	-.17378	-.09748	.03692	(.37612)
LAST CHANGE: NEIGHBOUR'S OPINION INF.	.03799	.06614	.04078	-.13433	(.32687)
LAST CHANGE: NEIGHBOUR'S PRACTICE INF.	.15131	-.06383	.14390	-.11597	(.35597)
LAST CHANGE: PROV. SPECIALIST INF.	.15933	-.17666	-.25772	.09498	(.32975)
LAST CHANGE: UNIV. RESEARCHER INF.	.12642	-.25153	-.29548	.23018	(.37515)
USE COMPUTER IN FARM OPERATION	(.31310)	.03873	(.40276)	-.05477	.27395

Note: correlations with values greater than .3000 and less than -.3000 are circled.

Source: Survey of Demonstrators; Factor Analysis.

consultants

1.4 Large Farms

Factor 4 is characteristic of large family farms. These participants are biased towards sole proprietorship, large acreage and mixed production. The income of these farms is higher than that for other operators.

1.5 Early Majority

Factor 5 exhibits characteristics of early majority seeking information. This category uses numerous sources of information including the Ag Rep's opinion, manufacturer's information, neighbour's opinion and practise and the opinions of the university researcher.

1.6 New Innovator Profiles

Insofar as the data can be interpreted through these analyses, a provocative pattern has emerged. It shows that the programs tapped farmers throughout the front half of the market cycle. Actual innovators do seem to be strongly represented in Factors 1 and 3. Community leaders, who may be more influential and accessible than innovative, have been tapped in large numbers by the Ag Reps to host on-farm demonstrations (Factor 2). Factors 4 and 5 appear to represent smaller numbers of hosts who do not properly belong in an innovation leadership group but may nonetheless be expected to show up in an open, farmer-initiated program.

2.0 Cluster Analysis

The 124 participants on whom there is complete survey data for all forty-three variables were also analyzed using cluster analysis. Cluster analysis groups cases into a specified number of clusters according to the degree of homogeniety of the cases on the independent variables. In the analysis from the data provided by the analysis from the data provided by the On-Farm Demonstrator survey, five clusters were specified and the homogeniety was measured on 43 variables.

Five Cluster Model

Cluster	Frequency
1	65
2	47
3	5
4	5
5	2

The frequencies indicate that when the cases are grouped as five clusters 65 cases have a stronger association with each other then other cases and thereby, become cluster 1. The same association is true with clusters 2, 3, 4 and 5. The strength of the association is not measured by the cluster analysis; however, given the weak correlations between variables described in II.6.1, it can be hypothesized that the association is not strong.

Two Cluster Model

When the constraint on the number of clusters was reduced from five to two, the number of surveyed demonstrators in each cluster went to 122 in Cluster 1 and two in Cluster 2. This indicates that in a two cluster analysis almost all of the participants were homogeneous in terms of descriptive characteristics while two participants were unique from the others. This appears to support an hypothesis that the association of participants in each cluster is not strong and the participants surveyed were homogeneous.

Description of the Two Clusters

The lack of association within the clusters reduces the descriptive ability of the variables. However, by compiling cross-tabulations of expected and actual numbers of participants in Cluster 1 and 2 some descriptive characteristics were evident in comparing the two clusters. Clusters 3, 4 and 4 were not used in the analysis because the number of demonstrations in each cluster were too low for the results to be significant.